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***Effect of the New Product Development Process on the Performance of Global New
Service Programs in the Business-to-Business Services Sector***

Christina Kollias

A Thesis

in the

John Molson School of Business

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Administration at
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Abstract

Effect of the New Product Development Process on the Performance of Global New Service Programs in the Business-to-Business Services Sector

Christina Kollias

Services are vital to our economy, and high growth and dynamism require that companies continually expand and adjust their services to stay competitive. At the same time, the economy is globalizing, which means that product and service firms must increasingly develop offerings that are successful internationally. Thus, the concern of this thesis is to understand how business-to-business service companies achieve success in their program of international new product development.

Literature exists on the topics of new product development (NPD), services marketing, and international marketing. But, little research has combined these areas and focused on new service development (NSD) for international markets. Moreover, no study has looked at the firm's NPD process—i.e., the stages and activities undertaken to bring a new product from idea to market launch—and how this impacts NPD performance, internationally. Based on a major study by de Brentani and Kleinschmidt (2001, 2002) covering a broad range of issues that describe and explain global NPD performance, this thesis focuses on the specific topic of the NPD process and its impact on success in developing and marketing new business-to-business services for international markets.

The research identifies and describes the dimensions that define the NSD process used for developing new services for international markets, and shows how these are linked to various measures of performance. Factor and reliability analyses yield a set of 11 descriptive NSD process dimensions; and correlation, multiple regression, and t-test analyses offer insights about what NSD process activities and approaches managers should focus on to achieve success. Results suggest that when establishing a global NSD process, a system should be set up, which ensures that up-front homework is conducted and “glocal” input is gathered. Managers should also encourage worldwide team involvement and they should share knowledge within the organization, worldwide. Findings also indicated that in contrast to what is generally believed, IT-based services do not appear to be related to success in the business-to-business sector.

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I INTRODUCTION

In today's rapidly expanding and changing economy, services have become the most vital and dynamic link to growth. According to the Bureau of Labor Statistics, not only does the service sector lead in current employment growth, but the ten leading industries over the next decade, which account for 60% of all projected job growth, will consist of service providers such as data processing, healthcare, transportation, and financial services (Meyer and DeTore, 1999). This means that firms that want to prosper, indeed survive, must actively undertake the development of new services. At the same time, companies are confronted with intense competition because of deregulation of markets and the advances in technology. This drives firms to seek innovation, in the hope that they can achieve a competitive advantage through the proactive use of new product¹ development (Cooper and Kleinschmidt, 1991). In addition to the dynamism of their economic sector, service firms must increasingly cope with the trend towards globalization. In other words, service firms must not only develop new products, but globalization has made the internationalization of the new service development effort a major requirement (Chiesa, 1996, 2000).

Extensive research has been conducted on the development of new physical goods (Cooper, 1979, 1996; Cooper and Kleinschmidt, 1987, 1990; Maidique and Zirger, 1984; Mathe and Perras, 1994) and many studies have been carried out to identify what are the key factors that yield successful new product development (NPD) outcomes (Cooper, 1979, 1994, 1999; Cooper and de Brentani, 1984, 1991; Maidique and Zirger, 1984;

¹ The term "product" hence (*NPD*) is used generically and can stand for either manufactured goods or services

Cooper and Kleinschmidt, 1991, 1995; Griffin, 1997). Although NPD studies are also relevant to services, they tend to ignore some key issues that distinguish services from manufactured goods. Hence, direct application of these manufactured goods studies to new service development can lead to some poor decisions. On the other hand, prior to the mid-eighties almost all new service related research tended to ignore the NPD studies, focusing exclusively on the unique characteristics that distinguish services from physical goods (Shostack, 1984). Only in recent years, have a number of major research efforts been undertaken that have focused both on services characteristics and the results of previous NPD studies in order to understand how to achieve success in new service development (Easingwood, 1986; de Brentani, 1989, 1991, 1995, 1996, 2001 Cooper and de Brentani, 1991; Edgett, 1994; Storey and Easingwood, 1998). In these studies, several factors have consistently been identified as likely determinants of NSD success. These include: new service synergy with the firm's resources and expertise, excellent market fit, quality of execution of launch and marketing activities, use of a formal and well-thought out NPD process and top management support for the NPD effort. In particular, a *formal NPD process* is one dimension that shows up in almost every NPD and NSD study as a factor that is significantly linked to the rate of success of new products and services (Booz, Allen, and Hamilton, 1982; Easingwood, 1986; de Brentani, 1989, 1991, 2001; Cooper, and Kleinschmidt, 1987; 1990; 1995; Edgett, 1994; Griffin, 1997). A formal NPD process describes the set of stages and activities companies go through in order to bring a new product or service from idea to market launch (Urban and Hauser, 1993).

Although globalization is occurring in all industries and at all levels, globalization of services particularly in the business-to-business sector is a fairly recent phenomenon.

This trend of services expanding globally is a result of firms taking advantage of major opportunities, and the advancements in communication and information technology, which bring about ease in internationalizing services since the need for a physical presence is less necessary. Moreover, this ease of globalizing a service, combined with the deregulation of markets has resulted in an increase of competition at the international level (Johne and Storey, 1998; Knight, 1999; Lovelock, 1999; Samiee, 1999). Therefore, a formal NSD process able to deal with the needs and differences of global markets might be optimal in introducing a successful international new service. The global new service development issue, however, is a subject that has not been addressed in the literature.

Despite the extensive research on how to achieve success in new product and service development, firms continue to deliver services that fail. Therefore, developing and marketing new services remains risky and challenging for firms (de Brentani, 1991, 2001; Golder, 2000). This, together with the continued growth, dynamism and recent trend towards globalization of the services sector suggests that much work still needs to be done in order to help firms deal with this challenge. There are several reasons why new service development requires particular attention. First, the service sector is continuously changing and thus, new learning is constantly required. Second, many of the NPD paradigms and “lessons for managers” we learn about from the literature are based on studies that focused primarily on the investigation of individual new product/service projects (Cooper and Kleinschmidt, 1995). This is unrealistic because a company typically has a number of projects at various stages of development and, thus, its performance is a function of the entire *program* of NSD effort (i.e., a portfolio of new development projects). Indeed, a recent study by Cooper and Kleinschmidt (1995),

which focused on the NSD program of firms showed that the success factors differed from those relevant for the individual project level. A third reason for undertaking more research in NSD is that past research has predominantly focused on consumer services, specifically financial services. Only a small number of studies have looked at business-to-business services, even though it is clear that marketing to business/organizational clients differs substantially from what is relevant in the consumer services sector (Cooper and de Brentani, 1984; de Brentani, 1989). Finally, but of no less importance, is the issue of globalization. The internationalization of both the manufactured goods and, more recently, the services sector requires a much broader framework for determining what is appropriate, indeed essential, for undertaking successful new product/service development. Thus, in summary, what distinguishes this research presented in this thesis is its combined focus on: new product development programs (as opposed to individual projects), services (versus manufactured goods), business-to-business market (versus consumer sector) and NSD for global markets (as opposed to domestic markets).

To achieve these research objectives, de Brentani and Kleinschmidt (2000, 2001, 2002) have undertaken a major “benchmarking” study that looks at both business services and manufactured goods, in order to identify the dimensions that explain performance in the sphere of international new product development. Pilot studies demonstrated very early in this research endeavor that one of the key factors distinguishing successful from less successful NPD programs was the process used by firms, in their international NPD effort. Thus, the study described in this thesis is part of the much broader research project. It has two main objectives: first, to explore and identify the dimensions that describe the global NPD process in the business-to-business service sector; and second,

to show in what way and to what extent the descriptive factors are linked to the performance of global new service development programs.

This paper is organized as follows. The second chapter describes past research/writings in the new manufactured goods arena; specifically, the models and processes used by firms to develop new products for industrial markets. Understanding the NPD literature is essential because a great deal of what is relevant for new services has been derived from this literature. Bearing in mind that the main focus of this thesis is on the NPD process, primary emphasis is placed on this aspect of the NPD literature.

The third chapter of this paper focuses on the topic of new service development. This section begins with a discussion of the importance of NPD in services, and what are the success factors for NSD that have been identified in previous research. The unique characteristics that distinguish services from physical goods —i.e., intangibility, simultaneity, heterogeneity and perishability— are then described and their impact on marketing and developing services is explained. Following this, is a description of the NPD process and its stages as it relates to services, including how the distinguishing features impact the process of new service development.

The fourth chapter of this thesis deals with the concept of globalization and its likely impact on the service sector and on the NSD process, as outlined in the literature. The differences in culture and the influence of globalization on teamwork are discussed. The last section of this chapter describes possible modes of entry service firms can choose from in their process to enter international markets.

The fifth chapter presents the research methodology, which included both a qualitative and quantitative approach. The quantitative data consisted of a sub-sample

from de Brentani and Kleinschmidt's (2000) database. A total of 105 cases were analyzed from a broad range of service companies that undertook new service development for purposes of maintaining, entering or expanding in international/global markets. In addition, ten personal interviews were conducted, in order to obtain anecdotal and qualitative information, which would enrich the data analysis outcomes. These exploratory interviews further allowed the author to acquire a greater appreciation for new service development through field research.

The next chapter provides a description of the results of the data analysis. First, the descriptive analysis is explained, which consisted of factor and reliability analyses. This yielded factors that describe what the NSD process should consist of and how it should be carried out. The second part of this chapter explains the results of the relational analysis, which was undertaken in order to determine links between the factors that describe the global NSD process of firms with the performance of the global NSD program of firms. The relational analysis was done in three ways: bivariate Pearson correlation, stepwise regressions, and independent t-tests analyses. The final chapter provides a discussion of the managerial implications of the findings, together with some conclusions and limitations of the study.

II NEW PRODUCT DEVELOPMENT

1 Importance of New Product Development

The development of new products² is an important part of any firm's marketing program if it is to ensure continued growth and increased profits (Urban and Hauser, 1993; Cooper, 1998). Firms face fierce competition because of constant changes in customer needs and preferences, a heightened pace of technological advances, and shorter product life cycles. As well, the deregulation of markets and the advent of globalization have intensified competition. This drives firms to product innovation in the hope of achieving a sustainable competitive advantage (Cooper, and Kleinschmidt, 1991; Cooper, 1998). Studies of companies that continuously introduce new products reveal that such firms are more likely to gain a sustainable competitive advantage (Zirger and Maidique, 1990; Urban and Hauser, 1993). On average, new products launched by these firms during the past five years represent approximately 32% of their sales and about 30% of their corporate profits (Griffin, 1997; Cooper, 1998).

The need for sound earnings growth is one of the most important forces impelling new product development (NPD) (Urban and Hauser, 1993). Investors in financial markets perceive product innovation as important because it appears to establish the value of the company as a long-term investment (Cooper, 1990). A study conducted on predictors of investment value showed that, when potential stock purchasers evaluate a company, they place most emphasis on its degree of innovativeness (Cooper, 1993; Cooper, 1998). Therefore, firms can use their level of innovativeness as a way of

² The term "product" hence (NPD) is used generically and can stand for either manufactured goods or services

increasing value, reducing the cost of capital, and of attracting new buyers (Cooper, 1993; Cooper, 1998).

Despite the fact that new products are deemed important and generate growth and profits for firms, typically only one NPD project in four will prove to be a winner (Cooper and Kleinschmidt, 1991; Griffin, 1997). According to Booz, Allen and Hamilton (1982) and also Page (1993), for every seven new product ideas that firms consider for possible development, four will be physically developed, but only one will be successful in the market. Moreover, new products that are launched in the marketplace have a 35% chance of experiencing failure (Crawford, 1979; Booz, Allen and Hamilton, 1982; Cooper 1998). This, however, does not take into consideration the rate of attrition, which is the number of NPD projects that “fail”, or are discarded, prior to being launched. This can prove to be rather costly and detrimental to firms due to the human and financial resources that had to be spent with no return on investment (Booz, Allen and Hamilton, 1982).

2 What is a “New” Product

Innovation is defined as the creation of a new product, service, or process (de Brentani, 2001). When a company is undertaking NPD, the word “new” can mean several different things. A new product can be classified in terms of its *degree of newness*, which can range from discontinuous products —that is, completely new-to-the-world products which often involve radically different technologies— to simple line extensions, or to minor product modifications that are of an incremental nature (de Brentani, 2001). When dealing with a discontinuous innovation, which is new not only

to the customer but to the firm as well, managers are faced with unique development and commercialization challenges due to the high level of uncertainty and risk associated with the new technology and the new or different market (Veryzer, 1998).

3 Success Factors in NPD

In today's competitive business environment, achieving positive outcomes in new product development is essential for the long-term success of any organization. An important prerequisite for a company wishing to compete and gain market share is to continuously evaluate its product offerings, as a weak product line typically results in negative consequences (Golder, 2000). For manufactured goods, researchers have undertaken many studies to help managers understand the process and factors that are closely linked to the delivery of successful new products (Cooper, 1979, 1996; Maidique and Zirger, 1984; Cooper and Kleinschmidt, 1987, 1990; Mathe and Perras, 1994). Over the last twenty years, however, success rate has not improved; indeed, it has worsened slightly. Research conducted in 1979 and 1982 (Cooper, 1979; Booz, Allen and Hamilton, 1982) showed that 65% of newly commercialized products were successful. On the other hand, a recent study conducted on a fairly large sample of manufactured goods and service firms revealed that the overall rate of success for newly commercialized products has decreased from 65% in 1982 to less than 60% in 1997 (Griffin, 1997). This suggests that resources are still being allocated to innovation efforts that result in failure after introduction. Clearly, developing a new product continues to be a risky venture.

Many studies have been carried out to identify what are the key factors that distinguish NPD winners from losers (Cooper, 1979, 1994, 1999; Cooper and de Brentani, 1984, 1991; Cooper and Kleinschmidt, 1991, 1995). These studies consistently show that such factors include: product uniqueness, a clearly defined product concept, customer need for the product and market attractiveness, project synergy with the firm's resources and expertise, market orientation and proficiency, top management support for the NPD effort, and a high quality of execution of the NPD process. In particular, one dimension that shows up in almost every study as a factor that is significantly linked to the rate of success of new products is a *formal NPD process* (Booz, Allen, and Hamilton, 1982; de Brentani, 1989, 1991; Cooper, and Kleinschmidt, 1987; 1990; 1995; Griffin, 1997).

4 Importance of the NPD Process

A formal NPD process is a “game plan” that provides companies with conceptual and operational models by which to conceive, develop and introduce new products (Cooper, 1993). A formal NPD process describes, in detail, the activities and decisions that should be carried out in every stage of bringing a new product from idea to market launch (Urban, and Hauser, 1993). The typical NPD process includes stages involving: idea generation, concept testing and evaluation, new product design, prototype and market testing, and launching activities. These activities can also be perceived as a means of gathering information and evaluating the product at various stages of the development, in an effort to successfully manage, direct and control product innovation efforts from idea to launch (Cooper and Kleinschmidt, 1991; Urban and Hauser, 1993;

Cooper, 1998). By implementing a formal NPD process, firms are automatically forced to think out their NPD objectives and activities in detail and to seek better communication and coordination between the people who are involved in this process. This, in itself, has been shown to improve NPD outcomes. Furthermore, both the quality and timing of NPD activities, such as conducting effective evaluations throughout the project and carrying out parallel processing of activities, will motivate the adoption of a formal NPD process (Cooper and Kleinschmidt, 1991), because it improves efficiency and effectiveness in delivering a new product (Cooper, 1993).

Undertaking a formal NPD process can help organizations reduce the failure rate of new products and thus minimize committing valuable resources to new products that eventually fail (Zirger and Maidique, 1990; Urban and Hauser, 1993). In general, NPD involves a substantial commitment of resources such as time, human and monetary resources. For example, Urban and Hauser (1993) state that (from the BAH (1982) study) carrying out a NPD process can incur costs that average 13.3 million dollars. Thus, considering the high cost associated with carrying out a full development process, companies are often tempted to “save” costs by skipping stages (Urban, and Hauser, 1993). But, in reality, this tends to increase both the risk and the eventual cost of developing products. This is because, although using a formal NPD process cannot eliminate risk altogether, it does aid in managing that risk (e.g., by ensuring that all required tasks are carried out, by involving the right people, and by conducting the appropriate research), which consequently leads to savings in expected time and cost, and in identifying profitable new products (Urban, and Hauser, 1993). Thus, by methodically going through all the stages of the NPD process, developers become increasingly more

knowledgeable about the project and simultaneously drive down uncertainties with every successive stage (Cooper, 1998).

5 Models of the NPD Process

As noted above, having a formal NPD process of superior quality has been found by researchers to be an important factor in bringing about new product success (Cooper and Kleinschmidt, 1995). A number of detailed NPD processes or models have been developed over the years, the best known of which is the Booz, Allen, and Hamilton (BAH) (1982) model, which underlies most other NPD systems that have been put forward. The BAH model (1982), which is presented in figure 1, embodies seven basic stages and describes the activities that should be carried out in bringing new product ideas to the marketplace. The BAH model proposes a sequential process, where the product moves from idea to physical product, to launch stage, with a number of evaluations and testing points in between. The model is briefly described below, and again in more detail, in the next section.

5.1 The Booz, Allen and Hamilton (BAH) Model

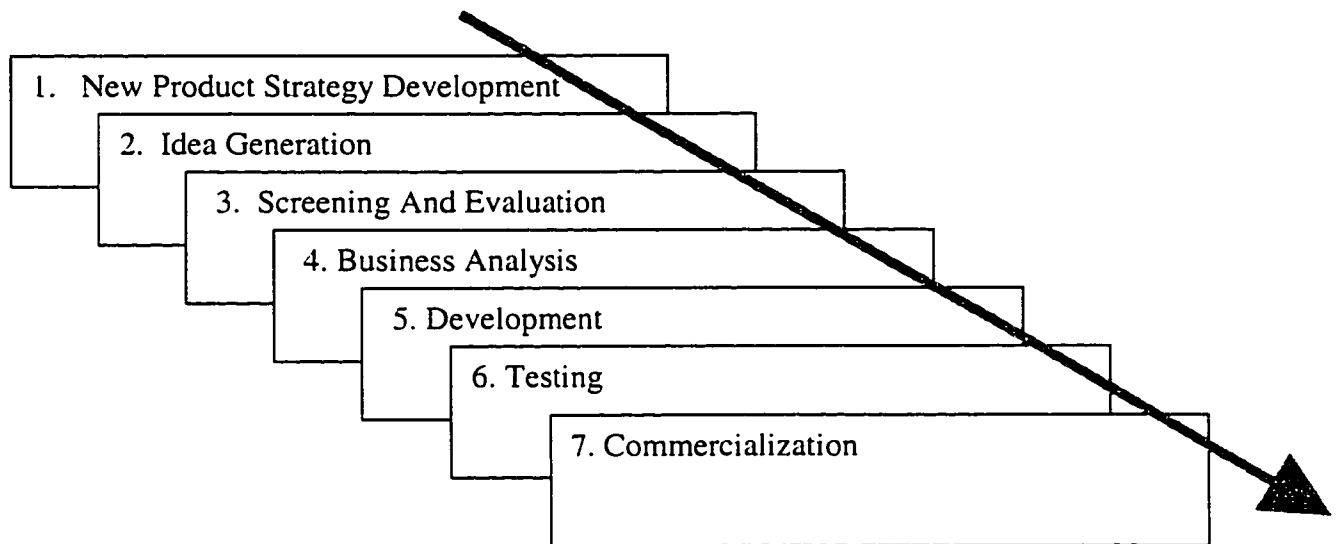
The first step in the BAH model is the “new product strategy”, which provides guidance for the new product effort and identifies the strategic business requirements that the new product should satisfy. The second step, called “idea generation”, refers to the systematic search for new product ideas to meet the strategic objectives. “Screening and evaluation”, the third stage, involves an analysis of the new product ideas in order to select the ones that reflect the objectives and resources of the organization, and that

appear to have substantial potential for successful development and marketing. The fourth stage, called “business analysis”, examines those ideas that pass through screening in terms of probable sales, costs, capital investment, and profit projections to verify that they satisfy company financial objectives. In stage five, the product idea moves into the “development or design” phase, which consists of translating the product concept into an actual physical entity. This may involve several design iterations and also some prototype tests to ensure the feasibility, functionality, and (sometimes) safety of the new product. The next stage, “testing”, verifies through market and final prototype tests that the planned version of the new product meets both customer and company needs. Finally, “commercialization” involves the introduction of the new product into the market. Each of the seven stages in the BAH model is discussed in greater detail in the next section (see 6 – Stages of the NPD process).

According to Booz, Allen, and Hamilton (1982), organizations that have a greater likelihood of successfully launching new products are those firms that have adopted a formal NPD process. Moreover, companies whose management places greater emphasis on the early steps of the NPD process improve their chances of success. This is because by undertaking evaluations and analyses early in the process, they ensure that new products have a good fit with market requirements and with the firm’s strategic objectives and resources.

Figure 1: The Seven Stages of the NPD process

(Booz, Allen, & Hamilton)



5.2 The Urban and Hauser Model

The sequential stage-based BAH (1982) model described in figure 1 has led to the articulation of many other models, all of which use the seven stages as a base. For example, Urban and Hauser (1993) suggest that the organization select a five-step decision process for its new product development. The first step of this process is called “opportunity identification” and consists of finding the best market to enter and of generating ideas that could be the basis for entry. The second step is the “design phase” where customer needs are extensively studied and assessed, a product is engineered, a marketing mix is developed, and the product is positioned. Next are the “testing” and

“introduction” phases of the NPD process. Essentially, advertising and product testing along with prelaunch forecasting and test marketing are recommended in order to be able to both plan and track a launch. Finally, Urban and Hauser go beyond the launch stage, including the “life cycle management” step, so that companies continuously monitor both the product and the market and make changes accordingly. Compared to the BAH (1982) model, Urban and Hauser’s model involves a more general framework with fewer steps. The last stage, however —life cycle management— is a step that goes beyond the BAH model, suggesting that products are in a continuous stage of development.

5.3 Cooper’s Stage-Gate™ Models

The “stage-gate™” system is a series of NPD process models developed by Cooper (1984, 1996, 1998), which also use BAH as a base, but which go further and adapt the model to more sophisticated NPD scenarios by incorporating “second-generation” and “third-generation” models. The second-generation model was developed by Cooper because the BAH (first-generation) model was too strictly focused on the technical design and development of the product, lacking specifications about what actions should be taken during and between each stage (Cooper, 1994, 1996, 1998). Cooper suggests that just having a process in place is not enough; “rather, it is the quality and nature of the process —that is, building in best practices— that really drives performance” (Cooper, 1998, p.35)

Similar to the BAH model, the stage-gate™ model also incorporates critical success factors and industry best practices that have been identified (Cooper, 1998). For example, Cooper advocates that the following success factors are critical to any NPD

process: conducting up-front homework prior to developing a new product, having a strong market orientation and customer input throughout the process, establishing early product definition, and focusing on quality of execution.

Cooper's stage-gate™ model (see figure 2) shares similarities with the original model (i.e., BAH model) in that it comprises some of its stages (usually 4 to 6 stages), but, it goes further by including "gates", which are different points in the process where assessments regarding resource allocation are made by "gatekeepers". These gates are where the project is evaluated and decisions are made about whether to continue or kill the project (Cooper, 1993, 1994, 1998). Cooper (1998) defines gatekeepers as "a management team of decision makers and resource owners responsible for facilitating the rapid commercialization of selected projects.

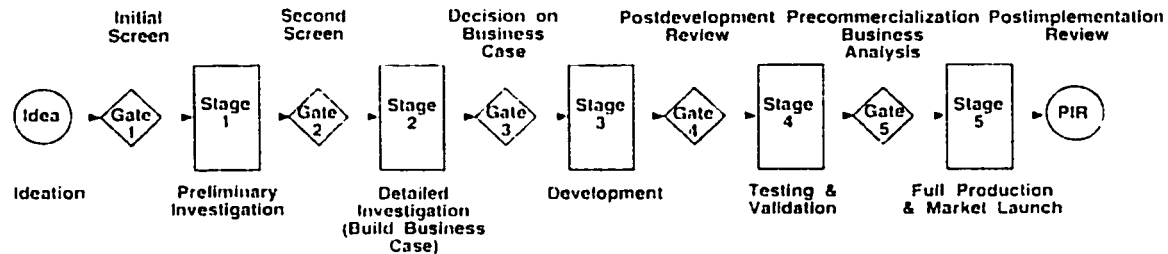
A distinguishing feature of the second-generation NPD process (vs. BAH) is that it is cross-functional at both the stages and the gates, which aids in decreasing organizational roadblocks. This means that there is no R&D or marketing stage, for example, but rather every single stage is made up of a set of parallel activities undertaken by individuals from different departments in the organization (Cooper, 1993). In addition, some stages may occur concurrently.

The third-generation model is an extension of the second-generation process. Cooper (1994) recognized that despite the increases in NPD effectiveness achieved by firms that were using the second-generation model, what was still needed was an increase in time and cost efficiency. This is partially achieved by recognizing that each company and each project has different requirements and that the stage-gate model™ has to be adapted accordingly (Cooper, 1998).

The third-generation process requires that six fundamental F's be incorporated in the NPD process: flexibility, fuzzy gates, fluidity, focus, facilitation, and forever green (Cooper, 1998). "Flexibility" involves managing the process (i.e., skipping stages and/or gates) according to each project's risk level and needs. For example, a stage might be skipped if the decision is made consciously and risks are well understood. "Fuzzy gates" suggests that when making decisions from one stage to the next, decisions can sometimes be made on conditional terms or in the absence of perfect information. "Fluidity" means that overlapping of stages can occur, where activities usually carried out in the next stage, may be started before the previous stage has been completed. "Focus" signifies that careful attention helps identify projects that should be weeded out. "Facilitation" stresses the importance of having a process manager or facilitator to verify that the NPD process works efficiently and effectively. "Forever green", the last of six F's, indicates that processes must constantly be reviewed and changes should be made accordingly, to ensure that the process is not out of date.

Companies undertaking NPD have, to an important extent, accepted the idea of using a formal NPD process. Griffin (1997) in her study of NPD practices, shows that approximately 60% of companies do use some form of stage-gate process. Moreover, of the firms that have adopted a stage-gate system, more than half have moved from a basic BAH-type process to a more sophisticated second or third generation system (Cooper, 1994, 1998), where more flexible gates and gate structures are being implemented.

Figure 2: A Generic Stage-Gate Model
(Source: Cooper, 1993)



6 Stages of the NPD Process

Although variations exist in the exact NPD process model adopted by firms, many organizations have adopted some variation of the basic model developed by Booz, Allen, and Hamilton (1982). Moreover, both the Urban and Hauser (1993) and Cooper's (1994, 1998) model, (as well as others in the literature) identify the seven BAH stages as critical to NPD. Hence, the study described and analyzed in this thesis looks at the NPD process of firms in terms of these seven phases, each of which will be now examined in detail.

6.1 New Product Development Strategy

Prior to commencing a new product development project, companies must set clear objectives (Wind, 1982). The purpose of this first step of the NPD process is to provide guidance for the new product effort. It identifies the strategic business requirements that the new product should comply with, and these are derived from the

corporate objectives and strategy of the firm as a whole. These business requirements assign roles to be played by the new products, which in turn are influenced by the individual needs of the industry (Booz, Allen, and Hamilton, 1982).

One important strategic decision that the organization has to make is whether to select a *reactive* or *proactive* strategy to drive its new product program. A reactive strategy is one that deals with the initiating pressures, as they appear. According to Urban and Hauser (1993), there are four different types of reactive strategies to choose from. The first, called the “defensive strategy”, protects the profitability of existing products by countering new competitive products. “Imitative strategy”, which is the second type of reactive strategy, is based on rapidly copying a successful new product in the marketplace. Next is the “second-but-better strategy”, where the organization reacts in a slightly more proactive way (compared to “imitative”) to competition by introducing a product that is improved and better positioned (Urban, and Hauser, 1993). Finally, there is the “responsive strategy”, which requires that the firm purposively react to customers’ requests (Von Hippel, 1986). One thing common to all reactive strategies is that the company tends to wait for something in the environment to happen and only then reacts.

In contrast to the reactive approach, when a company uses a proactive strategy, it allocates resources in a preemptive way in order to deal with undesirable future events or to attain specific objectives (Urban and Hauser, 1993). Proactive strategies can also be further divided into distinct types. The first one requires that research and development be intensely involved in developing technically superior products. The second type of proactive strategy requires that the marketing department makes it its business to comprehend the input provided by customers, and then attempts to develop a product that

satisfies their needs. The third type of proactive strategy is called “entrepreneurial”. Basically, an entrepreneur comes up with an idea and makes it happen by building venture enthusiasm and generating resources. Next is the “acquisition” form of NPD strategy, where the purchase of other firms also incorporates the purchase of new products to the acquiring firm and sometimes even to the market. Finally, there is the “alliance” type of proactive strategy, whose purpose is to bring together a pool of skills in order to design and deliver a superior product (Urban, and Hauser, 1993).

Whether a company selects a reactive or proactive approach depends on several factors. Growth opportunities, probable protection for innovation, scale of the market, time horizons, strength of the competition and the organization’s position in the production and distribution systems are all factors that contribute to the firm’s decision as to which approach to select.

Although Booz, Allen, and Hamilton (1982), long ago, recommended that NPD projects begin with a strategy setting step, because this leads to more focused efforts and provides direction for the process, this is an area that has improvement opportunities (Griffin, 1997). Griffin’s (1997) NPD study demonstrated that approximately 76% of the best performing firms used specific strategies, while less than 60% of the lower performing companies actually used one. Thus, even though more and more companies are incorporating a business strategy, firms nevertheless still develop products unlinked to strategy.

6.2 Idea Generation

Once the organization has set clear objectives and a well-defined strategy for new product development, the “idea generation” stage begins. This entails the systematic search for new product ideas. After defining the market(s) and segment(s) it wishes to target, the firm must develop ideas for products in order to take advantage of the identified opportunities. A firm typically has to generate many ideas in order to find a few good ones. According to Griffin (1997), an average of 100 ideas must be generated in order to yield 15.2 successes; put otherwise, one success comes out of every 6.6 ideas. This number is not different from what Booz, Allen, and Hamilton found in 1982, when they determined that it took seven ideas to generate one success.

There are many sources from which a company can derive ideas. Internal sources (i.e., employees, managers), and external sources (i.e., customers, competitors, distributors, and suppliers) are just a few of the many alternative-initiating forces that exist (Wind, 1982; Crawford, 1997; Cooper, 1993; Urban and Hauser, 1993). Organizations that are effective in idea generation are those that do not focus solely on the initiation force (i.e., the first source to generate an idea), but who concentrate on all potential idea sources (Crawford, 1997). The company can derive new ideas from implementing formal research and development. This, however, requires that companies provide their employees with environments where idea generation is encouraged, because the whole organization—not just a department—should be responsible for generating ideas (Wind, 1982; de Brentani, 1989; Cooper, 1993; Urban and Hauser, 1993). According to the marketing concept, customers can also be a good place to start searching for new product ideas. Von Hippel (1986) determined that, for new industrial

products, most ideas (85%) are generated by their customers. Customers and prospects are usually the main source of ideas for new industrial products; thus, they tend to have a strong influence on the new product development program of a firm (Cooper, 1993; Crawford, 1997). Firms can also carefully study competitors' actions to obtain clues about their new products and ways in which they can improve them (Cooper, 1993) . Finally, distributors and suppliers can provide some helpful insights on new product possibilities such as new techniques and materials that can be used to develop new products. However, idea sources are not restricted to the ones just mentioned. New product ideas can also originate from other sources such as new product consultants, marketing research firms, university and commercial laboratories, government agencies, seminars, and so on (Wind, 1982; Easingwood, 1986; de Brentani, 1989, 1991; Crawford, 1997).

Although there is a multitude of sources for new product ideas, there are also many different methods that the company can utilize directly in order to generate ideas. A large number of ideas are generated via direct research, technical innovation, exploratory consumer studies, facilitating lead user solutions, creative group methods, alliances, acquisitions and licensing (Urban, and Hauser, 1993). The most commonly employed methods for generating ideas include brainstorming, morphological analysis, need/problem identification, and gap analysis (Crawford, 1997). The goal of the idea generation stage is to create a large number of very different ideas from which the firm can select the ones that seem to be most feasible and most promising. The more ideas generated, the greater the likelihood of achieving success.

6.3 Screening and Evaluation

Once the organization has generated a good pool of ideas for new products, the purpose of the third stage (i.e., screening and evaluation) is to identify those ideas with the best potential for success and to reduce the number of ideas to a more manageable set. The objective of screening is to identify those ideas that will be allocated further resources, and to drop those with less potential (Cooper, 1988). This involves making the idea a business possibility, and assessing it for its potential value to the company (Wind, 1982). The rationale is that product development costs rise substantially with each successive stage in the NPD process (Booz, Allen and Hamilton, 1982; Urban and Hauser, 1993). Thus, it is to the company's benefit to proceed only with those ideas that are expected to yield successful products. The surviving ideas, those classified as "GO" ideas, must then be screened further using one of many rating processes commonly employed in organizations (Cooper and de Brentani, 1984, de Brentani, 1986).

To carry out further evaluation, the ideas that are classified as "GO" must be described on a standard form that can be assessed by a new product committee. The description encompasses not only the idea but also the target market, competition, and also gives rough estimates of the market size, product price, development time, costs, and rate of return (Cooper, 1998). The new product committee then assesses each idea against a set of criteria, which verify the attractiveness and visibility of the idea as well as its fit with the company's objectives, strategies, and resources. Therefore, the outcome of the screening stage is a ranking of NPD proposals, such that resources can be allocated to the projects that seem most promising (Wind, 1982; Crawford, 1997).

When undertaking screening, firms must try to avoid two common errors. The first one, called the Type II error, occurs when the company dismisses an otherwise good idea (Whitley, 1996). When such errors occur too many times, it is thought that the organization has very conservative standards. The second type of mistake is called a Type I error and it is the exact opposite of the previous one (Whitley, 1996). It pertains to companies that allow poor ideas to move into development and commercialization. When this type of error occurs, companies not only incur unnecessary costs in research and development and commercialization, but they may also forego the development of better ideas due to lack of resources. While the Type II error is very difficult to identify, Type I error is rather obvious when a new product fails after being launched (Kotler and Turner, 1998). Therefore, it is most essential that an effective screening process be implemented to minimize the possibility of making either one of these two errors (Cooper and de Brentani, 1984; de Brentani, 1986).

Top management is responsible for choosing the criteria that will be utilized in screening the new product proposals. A study conducted by Cooper and de Brentani (1984) (see also de Brentani, 1986) revealed four main considerations that guide screening decisions for new product ideas. These include the financial potential and the product differential advantage that the new product can have, as well as two synergy factors, namely corporate and technological synergy. This may suggest that managers rely on oversimplified evaluative criteria to screen ideas seeing how they do not assess any market criteria. An effective screening, however, should cover all aspects considering the impact it can have on the overall performance of a firm's new product program (Cooper and de Brentani, 1984).

Compared to the study conducted by Booz, Allen, and Hamilton (1982), Griffin's study demonstrated that although little improvement has been achieved in terms of the number of ideas that must be generated to yield a success, companies have improved on their screening methods. Whereas the greatest number of projects were screened out during the development (i.e., design) stage in 1982, in 1995 the largest number were eliminated during idea screening and business analysis, which is the next evaluation step in the process, just after screening (Griffin, 1997). Thus, even though NPD success rates have not increased, companies have improved on weeding out less promising projects earlier in the NPD process (Griffin, 1997). This proves to be more cost efficient for organizations because they spend less time and money on projects that will eventually fail.

6.4 Business Analysis

The business analysis is the next stage in the NPD process. It involves a detailed quantitative analysis of performance criteria of the new product. In other words, it is a review of the potential sales, costs, and profit projections of the new product in order to determine whether these factors satisfy the company's objectives. If conclusions show that the new product is expected to meet the company's goals, then the new product concept can move to the development stage. According to Booz, Allen, and Hamilton (1982), from the companies surveyed in their study, nearly two-thirds formally measure new product performance using more than one performance criterion. They found that the three criteria that were used most often included: profit contribution, sales volume, and return on investment. Griffin (1997) also found that among the firms taking part in

the study, 75.6% developed formal financial objectives against which performance was measured. She also noted, however, that organizations did not always go back and assess their actual performance.

Management must estimate whether expected sales will be high enough to yield a satisfactory profit. This requires estimates of: first-time sales, replacement sales, and repeat sales. These approximations will further depend on whether the new product is a one-time-purchase product, an infrequently purchased product, or a frequently purchased product (Kotler, and Turner, 1998). In order to estimate potential revenues, components such as market size, market share, expected selling price, price elasticity, and an analysis of the probable product life cycle must be conducted carefully.

Aside from the sales forecast, project managers are required to estimate the expected costs and profits (Cooper, 1998). This demands that all costs are considered and necessitates estimations from R&D, marketing, and finance departments. Factors such as expected development costs, operating costs, marketing and management costs must be taken into account (Miller, 1993). Uncertainty about estimates, however, arises from such factors as competition and expected demand. Some companies are expected to incorporate in their forecasts such aspects as the maximum investment exposure and the payback period, which is the time the company needs to recover all of its investment (Miller, 1993).

In Cooper's (1998) stage gate model, the business evaluation step is defined as the "critical homework stage". Cooper (1993) suggests four methods to carry out a business analysis: benefit measurement models, economic models, portfolio selection models, and market research models. The "benefit measurement" model requires that knowledgeable

respondents give subjective information with regard to attributes of the project (e.g. fit with corporate objectives). The second model called “economic model” requires that the project under consideration be evaluated using conventional financial criteria. The “portfolio selection” model serves “to develop a portfolio of new and existing projects to maximize some objective function, subject to a set of resource constraints” (Cooper, 1993, p.171). The last model, “market research”, presumes that the only decision criterion for moving forward with the new project is expected market acceptance.

Concept testing is yet another part of business analysis (Cooper, 1993). This is carried out before the actual development of the product and assesses the likelihood of market acceptance of the new product. The product concept can be presented to customers in different forms such as written descriptions, drawings, videos, dummy brochures, or crude prototypes. Focus groups and customer surveys are two methods that can be used to gauge reactions to the proposed concept.

If results of the business analysis of the new product conform to company objectives, the new product team can move on to the next stage, called “development”. One must keep in mind, however, that as new information is revealed, it is most advisable that the business analysis undergoes revision and expansion (Urban and Hauser, 1993). Considering that, with every successive stage of the NPD process, estimates become more refined and accurate, companies should continue conducting financial evaluation throughout the NPD process. Much more probable and more accurate forecasts of sales, profits, and costs are likely to be predicted if evaluations are held at the end of the development stage and again during the testing stage (Urban, and Hauser, 1993).

6.5 Development

Once the up-front homework has been carried out and the product has been described in terms of target market, product concept, and positioning, the next stage is “development”, which consists of turning the product concept into a physical entity (Cooper, 1993). Tasks undertaken in this stage include design of the product, testing the prototype product at every step of the development phase, and developing plans for the launch (Cooper, 1993).

Translating an idea into a physical entity can be difficult (Cooper, 1993). For example, this difficult conversion may occur because when designing the actual product, the new product team may have disregarded customer needs (Cooper, 1993). Technical problems may also arise, which may result in the exclusion of features requested by customers. A changing environment, with different needs and more competition can also impede the development of a successful new product (Cooper, 1993).

Thus, as the product proceeds from one step of the development stage to the next, the new product team should reassess the market, position, product and technology in order to increase chances of delivering a successful product (Cooper, 1993; Urban and Hauser, 1993). This requires the cooperation from all functions in the organization (Adler, Riggs and Wheelwright, 1989; Cooper, 1993; Urban and Hauser, 1993). “The ability to work together effectively is a formidable competitive asset and one that is exceedingly difficult to imitate” (Adler, Riggs and Wheelwright, 1989 p.14). Marketing and R&D functions, in particular, should collaborate because, while marketing can express the needs of customers, R&D has the capacity of turning a product concept into

an actual physical entity. Therefore, they should work together to make sure that the product meets customer requirements (Urban and Hauser, 1993).

Many companies are realizing that the conventional team methods for bringing products to the market need to be changed. In traditional hierarchical organizations, each functional area works on its part of the process, and then passes the activity on to the next department (Bishop, 1999). The development of cross-functional teams is a type of team that has gained more and more recognition in a multitude of companies. According to Steensma and Tetteroo (2000), cross-functional teams are defined as “representative teams that encompass the knowledge, skills, and interests of different departments within an organization”. This is especially important when teams are brought together to develop a new product where risk, investment, and sunk costs are usually at their highest (Kotler and Turner, 1998). The objective of this type of team is to work together in identifying and solving problems efficiently by coordinating resources and ideas (Bishop, 1999). Compared to traditional teams, these cross-functional teams are expected to decrease their work time, increase learning, and improve innovation (Denison, Hart and Kahn, 1996; Uhl-Bien and Graen, 1998). The level of team performance is dependent on the interaction between the team members, and not on the level of the individual’s own experience (Snizek and Henry, 1989).

Even though cross-functional teams are most commonly implemented in new product development processes (Denison, Hart, and Kahn, 1996), managers must understand that the use of cross-functional teams is not the best approach to every situation and that creating a successful team is not an easy task. Given the responsibility the leader has for ensuring the commitment of stakeholders to the team's goals and

objectives, it is critical that the leader within the team has effective leadership skills (Bailey, 2000). In fact, the main objective is to encourage team members to utilize their talent and skills for the project. Moreover, to encourage communication between group members it is recommended that the team engage in participative leadership, where the power is spread equally between team members (Bishop, 1999).

6.6 Testing

Considering the amount of time and money invested in bringing a new product from the original idea to a physical entity, the next stage consists of testing the launch and marketing strategy and its components. The purpose of the testing phase is to experiment and improve the new product, so that customers at least derive the minimum expected benefit (Urban, and Hauser, 1993).

This phase is extremely important in that it may dramatically decrease the chances of failure in launch, since it has the capacity of revealing flaws that could cause market failure (Urban, and Hauser, 1993). The disadvantage with the testing stage, specifically market testing, is that it delays the firm from introducing the product, which may be an advantage for competitors who are looking to imitate or launch a second-but-better product (Urban and Hauser, 1993).

Testing the new product, however, should not be solely restricted to this stage. It must be conducted throughout the NPD process. This necessitates that extensive marketing research be carried out all through the NPD process and that different types of testing —i.e., concept testing, prototype/development testing, and test marketing— should be carried out (Cooper, 1993, 1998). The first one, called “concept testing”

involves testing the new product idea with potential users at the end of the screening stage or prior to the development phase. This is expected to yield useful information such as intent to purchase and suggestions for improvements, which will eventually guide the marketing effort.

The second type of testing, “prototype/development testing”, expects the product being evaluated to be as similar as possible to the final product that will be launched. The purpose of this type of testing is to indicate how the product will perform under actual consumer use situations (Wind, 1982; Cooper, 1993; Crawford,1997). Management can therefore decide to conduct laboratory tests, expert evaluations, customer tests, or any combination of these (Urban, and Hauser, 1993). In an industrial setting, for example, testing would be carried out at firms of potential customers (i.e., “Beta” testing) where different people can provide their input (Urban and Hauser, 1993; Crawford, 1997).

The last type of testing is called “test marketing”. This is the stage where, once the new product has passed the functional tests, the product and marketing program (i.e., positioning strategy, advertising, distribution, pricing, branding, budget levels) are tested in more realistic market settings (Urban and Hauser, 1993). This allows the firm to gain some experience with marketing the new product prior to going to the expense of a full launch. In other words, test marketing can reduce significantly the risk of failure.

6.7 Commercialization

The last stage of the NPD model, called “commercialization”, consists of introducing the new product into the market. This step usually involves high costs. Typically, costs of commercialization represent approximately one third of total development costs (Booz, Allen, and Hamilton, 1982; Griffin, 1997). Costs incurred are associated with marketing and the manufacturing facility. Marketing expenditures can be substantial, representing over half of sales revenue during the first year (Urban and Hauser, 1993).

The first step of this stage is for the company to decide what time is ideal for introduction. Market-entry timing is very important. Considerations are attributed to competitors, the company’s current product line and whether or not the new product is seasonal (Alpert and Kamins, 1994). Further decisions have to be made with regard to where to launch the new product. Most companies do not have the means (i.e., capital and capacity) to launch their new product nationally or even internationally. Small companies must resort to a planned market rollout over time (Urban and Hauser, 1993). This signifies that the product is introduced in areas or cities that seem attractive, one at a time. On the other hand, larger companies may quickly introduce their new product into various regions or even into the full national market. The decision as to which market the new product will be introduced first also depends on criteria such as market potential, company’s local reputation, cost of communication media, influence of area on other areas, and competitive penetration (Urban and Hauser, 1993).

Many companies approach this market rollout by focusing the design of their new product to sell mainly in their domestic market. If the product attains success in the

market and is profitable for the company, it will consider introducing it to other countries by making adjustments to the product where deemed necessary (Kotler and Turner, 1998). According to Cooper and Kleinschmidt (1991), however, this can prove to be detrimental for the company. Their study revealed that industrial companies that design the product from the beginning with an international focus are much more profitable in both their domestic and international markets compared to those companies that initially develop a product only for the domestic market.

7 Project vs. Program

Although many NPD studies offer insights about the factors that lead to success and failure, companies still introduce products that fail. One possible explanation is that previous studies have focused primarily on individual projects in order to make generalizations across different types of products and industries. For any given firm, however, delivering high performance does not depend solely on the outcome of one project. Firms are typically involved in a portfolio of projects, and corporate performance is thus based on an entire program of NPD effort. In other words, it is usually a company's activities over several NPD projects that will determine how to bring about desired outcomes (Adler, Riggs, and Wheelright, 1989; Urban, and Hauser, 1993).

Cooper (1991) and Cooper and Kleinschmidt (1995) were among the first to conduct research that identified NPD success factors at the program level. Their purpose was to reveal dimensions that impact a company's overall new product performance over several ventures in a given time period. According to Cooper and Kleinschmidt (1995), five program/company level factors drive NPD success and positively impact

performance: the NPD process and its specific activities, the team that undertakes the NPD effort, the organization's NPD strategy, the firm's culture and climate for innovation, and lastly management's commitment to NPD. This suggests that dimensions other than those related to a particular project come into play when running a successful new product program. Golder (2000) supports this notion by demonstrating that when companies evaluate their performance over several projects, the perceived risk of subsequent new product developments is lower. Therefore, the factors that lead to success at the company level may be different than what is relevant at the project level.

Moreover, because NPD projects can differ radically (e.g. minor adaptations, imitations to totally new to the world products), the NPD process factors may also differ between the program and the project level. Hence, studying a company's NPD program to determine success factors may be more realistic than focusing on individual projects, because it encompasses the overall picture of the company. Cooper and Kleinschmidt's (1995) study of NPD/Performance at the program level showed that using a formal, well-planned NPD process is an important key to NPD program success. Thus, the analysis undertaken in this thesis will look at the NPD process at the program level.

III NEW SERVICE DEVELOPMENT

1 Importance of the Service Sector

In recent years the service sector has become the most dynamic and highest growth sector of our economy. Services account for nearly 60% of gross national product, worldwide (Jackson, Neidell, and Lunsford, 1995). In Canada, services represent 67% of the gross domestic product, which clearly suggests the importance of the service sector in today's economy (Lovelock, 2001).

Although the service sector has traditionally been dominated with the end users being individual consumers, the industrial service sector is constantly growing. For example, business-to-business services account for over 30% of all the service revenues in the United States (Wilson, and Smith, 1996). Therefore, the prominence of the service sector in our economy is rather obvious.

2 Importance of NPD in Services

Substantial literature exists on the NPD (New Product Development) of manufactured goods. However, much less research has been conducted on the topic of new service development (NSD), especially in the high growth industrial sector, even though it is well established that services differ significantly from physical/manufactured goods (Berry, 1980; Jackson, Neidell, and Lunsford, 1995). Thus, relatively little information is available to assist managers in developing successful new services (Terrill, 1992).

New Service Development (NSD) can be perceived as a generic of NPD. In some respects, the approach to NPD is the same, regardless of whether services or

manufactured goods are being developed. However, certain marketing concepts, models, and tools appear to be inappropriate when applied to service firms, which stresses the need for service specific marketing frameworks (Grönroos, 1990). Research in services marketing has predominantly focused on consumer markets, and extensive studies have been undertaken to describe how services differ from physical goods in the consumer market (Easingwood, 1986; Bowers 1989). However, given the extensive growth in recent years of the business-to-business services sector, researchers have started exploring NSD in this area in greater depth (Scheuing and Johnson, 1989; de Brentani, 1989, 1991, 1995; de Brentani and Ragot, 1996).

Findings by several researchers indicate that, when developing new services, companies tend to create services in a haphazard fashion (Shostack, 1984; de Brentani, 1989), and that they do not use rigorous and formal processes to introduce a new service (Brown, Fisk, and Bitner, 1994; Griffin, 1997). This may result in a high rate of failure for new services since they may not be responding correctly to customer needs. Contrary to the development of new manufactured goods, in new service development, application of formal processes is a relatively recent phenomenon (de Brentani, 1989, 1991; Griffin 1997). Researchers have found that firms who take a formal approach towards NSD are more likely to be successful (de Brentani, 1991; Edgett, 1994). Terrill (1992) suggests that, when developing a new service, a formal yet flexible development process is most appropriate. However, service firms usually do not plan their new service offerings around a formal NSD process (Martin and Horne, 1993).

A study conducted on a fairly large sample of firms from both the manufactured goods and services sector showed that manufactured goods firms were more likely than

service producers to implement a formal NPD process. The findings indicate that nearly 60% of the service companies did not use a formal process to develop the new service compared to less than 40% in the manufacturing sector (Griffin 1997). Even more disconcerting, another study concluded that none of the participating service firms had been using a process for more than five years (Mitchell Madison Group, 1995). Indeed, over 25% of these companies had implemented a process less than a year ago, and only half had been using a process for one to four years. Thus, as will be discussed, given the size, growth and dynamism of the service sector, it is important to research and understand NSD that is guided by a formal process and geared specifically for services.

3 Success Factors in NSD

As stated previously, research on the development of new services has been rather limited. Moreover, those studies that have been carried out either focused on the unique characteristics of services that distinguish them from manufactured goods (Shostack, 1984; de Brentani, 1995) or drew from the research stream of NPD, using a comparative methodology (Edvardson, and Haglund, 1995). Easingwood (1986) was the first to study the success factors in new service development. Since his publication, an array of research has revealed additional new service development success factors (de Brentani, 1989,1991,1995; Edgett, 1994; Storey and Easingwood, 1998). They determined that implementation of a formal NSD process, combined with an effective NSD management, could have a positive effect on new service performance.

According to de Brentani (1989, 1991) and Cooper and de Brentani (1991), when evaluating new service performance, five factors are imperative in distinguishing

between winners and losers. The first factor, called “synergy”, describes the degree of fit between the needs of the project and the resources, skills, and experience of the organization. The more synergistic the new service, the greater the chance of success. Indeed, new services that had an excellent fit were over four times as successful as services that did not have synergy. The second factor, called “product/market fit”, depicts the extent to which the service satisfies customer needs and wants. “Quality of execution of the launch” is the third factor, and a “unique superior product”, which is the most important factor in NPD of manufactured goods, is ranked fourth in the development of new services. Services were found to be more successful when they were designed to be more unique, more reliable, and of higher quality. Finally, “quality of execution of marketing activities”, ranked as the fifth most important factor, ensured the successful delivery of a new service. Essentially, this stresses the importance of having a strong market orientation throughout the entire NPD process. This same study also determined that the following six factors can be classified as secondary factors in delivering a successful new service to the market: service expertise, market size and growth, quality of execution of technical activities, quality of execution of pre-development activities, quality of service delivery, and tangible evidence.

Martin and Horne (1993) studied the impact of service innovation on the performance of an organization. Their research revealed that successful service firms are those that are effective in managing the new service development and that use formal NSD processes.

Another study conducted by Edgett and Parkinson (1994) concluded that there are three factors, which contribute most to the successful delivery of services. In order of

importance these are: market synergy, organizational factors, and finally market research factors. On the other hand, Atuahene-Gima (1996) states that technical synergy can bear a negative consequence on new service performance, because a close fit with a firm's current technologies also allows competitors to quickly imitate the new service, which does not provide the firm with a competitive advantage.

Although substantial literature on the successful delivery of both new products and new services exists, organizations nevertheless still introduce failures. Cooper (1999) attempted to give seven possible explanations as to why this might be occurring. These include: ignorance, lack of skills, a faulty or misapplied NPD process, overconfidence, a lack of discipline, cutting corners to deliver a product quicker, and the lack of resources. This was corroborated by Griffin (1997) who found that most organizations do not assess their level of performance against their objectives consistently across all projects. She determined that, among best practice firms, performance is assessed in approximately 63% of the projects, while the rest evaluate performance only 48% of the time, which bears a statistically significant difference. Neglecting to assess performance against objectives throughout the process, can lead to potential failures that could have been avoided if assessment of performance had been carried out. Finally, a playing field that constantly keeps changing might be another reason that aids in service failure. Given that services usually have a shorter life cycle than manufactured goods, at launch "the market's requirements may have already shifted into the next phase of evolution" (Terrill and Middlebrooks, 1996, p. 323).

Although the success and failure studies of new services described factors similar to those found for goods, they also revealed some important differences. Moreover, these

same studies show that it is important to take into account the features that distinguish services from physical goods in order to better understand and appreciate variations that occur when developing new services. This brings us to the following section, which describes the unique characteristics of services.

4 Unique Characteristics of Services

According to Kotler, Armstrong, and Cunningham (1999), a service is any activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything. A service's production may or may not be tied to a physical product (Lovelock, 2001). Many researchers have determined that there are important differences between physical goods and services (Berry, 1980; Zeithaml, Parasuraman and Berry, 1985; Lovelock, 2001). For example, a study conducted by Jackson, Neidell and Lunsford (1995) determined that approximately 75% of industrial buyers use a different method to purchase services compared to physical products due to services' distinct characteristics. Thus, a company must consider four distinguishing characteristics of services when undertaking new service development and when designing marketing programs: intangibility, inseparability, heterogeneity, and perishability. Each of these is discussed in some detail below.

4.1 Intangibility

Services are invisible entities that cannot be touched or inspected and thus are more difficult to evaluate prior to purchase (Berry, 1980, 1995). Intangibility leads to several challenges for service marketers. First, it is difficult for the seller to display a

service prior to the consumer experiencing it. Intangibility creates difficulties in evaluating new service concepts and in being appreciated by the customer for providing a highly innovative service (Easingwood, 1986; de Brentani, 1989). This distinctive characteristic of services also complicates the task of achieving a competitive advantage (Shostack, 1984; de Brentani, 1991, 1995).

Potential customers often describe a service in terms of the experience, trust, feeling or security they felt during the buying and consumption process (Grönroos, 1990; Terrill, 1992). This is a challenge for marketers of new services and requires that emphasis be placed on creating a strong service image as well as associating the reputation of the firm to the service offering (Shostack, 1977; Nicoulaud, 1980; de Brentani, 1989; de Brentani and Ragot, 1996).

Also related to intangibility is that potential buyers often evaluate a service by relying on tangible cues. Most service offerings are a mixture of tangible and intangible components (Berry, 1980). Even though the service may be intangible in nature, usually some physical elements will make up its total entity (Shostack, 1977). Thus, providing potential clients with physical clues or “evidence” such as brochures, manuals, and logos can further clarify, in customers’ minds, the type of service as well as differentiate the firm’s offering from its competitors (de Brentani, 1989, 1991). This makes the task of evaluating services relatively easier.

Considering that for a service there is usually no physical entity, there is a perception that intangibility makes services easier to develop (or to modify) (Shostack, 1984). This perception can lead to a proliferation of similar service offerings in the market, which can have a negative performance effect (Shostack, 1984; Easingwood,

1986; de Brentani, 1989). The perception of ease of development can also lead to poor service designs because firms often introduce their service products too quickly by moving hastily through the stages of the new product development process (Shostack, 1984; de Brentani, 1989, 1991). Consequently, this can result in the introduction of services that do not meet customer needs (Shostack, 1984).

Another problem that arises from intangibility is the inability to patent services, which means that competitors can quickly copy new service developments (Easingwood, 1986; de Brentani, 1989, 1991). Intangibility makes it difficult to obtain a patent, because there is no physical product; it is simply an idea, a concept that is converted into a service. Therefore, in markets where one can choose from similar service offerings from several competing firms, achieving and maintaining a competitive advantage can prove to be extremely difficult (de Brentani, 1991).

4.2 Simultaneity (Inseparability)

“Generally, goods are produced, then sold, and then consumed. Services on the other hand are usually sold first, then produced and consumed simultaneously” (Berry, 1985, p. 17). Simultaneity means that services are commonly produced in the presence of customers. Even though customers may be exposed to only one part of the process, this distinguishing characteristic of services has the effect that there is often substantial contact between customers and suppliers during the service production process (Jackson and Cooper, 1988). Hence, the quality of interaction between service provider and customers is of utmost importance for ensuring the success of a service offering. Aspects such as service speed, reliability and variability are associated with the perceived quality

of the service offering. Thus, management should verify that customers receive, to the extent possible, the best experience of the tangible component of the service (Grönroos, 1990, 1998).

Another result of the simultaneity dimension is that customers frequently evaluate quality and satisfaction, not only by the outcome of the service, but also by the process they experienced when the service was produced and delivered (Grönroos, 1990, 1998). Therefore, buyers' perception of the service quality given by the frontline personnel is often critical for success (Berry, 1980; Easingwood, 1986; Grönroos, 1990). It is thus recommended that service providers that require frontline personnel in delivering a service be very selective in choosing and training the personnel that will interact with customers (Easingwood and Arnott, 1991). Moreover, at the design stage, the developers must consider the planned encounters between customer and service provider. This is particularly important for international service firms that must implement sophisticated recruitment and training techniques to ensure that the personnel that will interact with clients is competent not only in designing and delivering the product but also in relaying and protecting the right corporate image (Nicoulaud, 1980).

Considering that simultaneity often implies that the service is produced in the presence of the customer, developing services based on the voice of the customer becomes a key criterion in successful service performance (Cooper and de Brentani, 1991; Griffin, and Hauser, 1993; Cooper, Easingwood, Edgett, Kleinschmidt and Storey, 1994). With time, as the market environments have become more dynamic and turbulent, organizations have to stay closer to their customers to understand companies and their changing needs and preferences (Gehani, 1992; Terrill and Middlebrooks, 1996). The

simultaneity factor in services offers service providers a unique opportunity to get this valuable information early in the NSD process. Because market needs reflect a high potential source of ideas, the closer and the earlier the new service developer gets to the customer, the better. In fact, in business-to-business situations, the customer is likely to be just as knowledgeable about the company's needs and how they should be assessed as the supplier, which makes the need to include the customer's input even more obvious for the organization supplying the service (Von Hippel, 1978; de Brentani and Ragot, 1996).

The simultaneity characteristic also provides opportunities to customize the service (Berry, 1980). Bearing in mind that a fundamental marketing objective is to meet customer needs, since customers are in contact with the service company's employees, the potential for tailoring a service to meet the individual needs of customers ought to be considered (de Brentani, 1991; Valikangas and Lehtinen, 1994). Customization involves means of competing on the basis of superior or unique service quality, in the hopes of fulfilling individual customer expectations of the service to a maximum, and creating long-lasting and unique relationships (Parasuraman, 1985). This, of course, is especially relevant in business-to-business relationships where service offerings typically must be adapted to each individual firm. For example, a study conducted by de Brentani and Ragot (1996), revealed that customer partnerships are particularly relevant in the industrial professional services sector, because customers can communicate their needs and assist the firm in determining what elements are required to develop a successful new service. However, it is important to note that not all services should be customized as this leads to higher costs, decreases speed of service, and possibly less perceived reliability. Frequently, customers want a highly standardized service. Thus, service

marketers face the strategic issue of determining the conditions under which customization should apply and the circumstances under which standardization should apply (Berry, 1980; de Brentani and Ragot, 1996; Terrill and Middlebrooks, 1996).

4.3 Heterogeneity (Variability)

Services are “heterogeneous” because, with every purchase, the process and the experience are likely to vary. The degree of heterogeneity depends on whether the service is rendered by an individual or a machine, the extent to which the firm manages variations, as well as the customer’s role in obtaining a service (Berry, 1980; Zeithaml, Parasuraman and Berry, 1985). The involvement of individuals in the production of a service brings about a level of variability in the service outcome (Berry, 1980).

When customers seek to consume a service that is rendered by an individual, chances are that, with every purchase, the experience will be different because the customer is likely to interact with different delivery personnel. This raises a problem of a lack of consistency in behavior, making services much less standardized than physical products (Nicoulaud, 1980). As a result, customers experience greater risk and uncertainty when purchasing a service. Moreover, when customers experience inconsistency whenever they purchase a given service, they tend to perceive the service firm as unreliable. Not only can this tarnish the service firm’s reputation, but it can also result in customers defecting to competitors (de Brentani, 1991). This requires that service providers constantly examine the quality of the service rendered and focus on reducing inconsistency (Shostack, 1987).

4.4 Perishability

Although services can be produced relatively quickly, compared to manufactured goods, service providers cannot stock inventory for future use in the way product firms can (Shostack, 1984; Griffin, 1997). This requires that service production be matched as closely as possible to fluctuating demand levels to increase profit during purchase lulls, while avoiding lost revenue during peak seasons (Berry, 1980; Grönroos, 1990; Shemwell and Cronin, 1994). Each circumstance, however, can lead to high costs due to the expenses incurred to support unused capital and personnel during lulls, as well as the opportunity cost linked with peak demand levels that cannot be met (Berry, 1980; Shemwell and Cronin, 1994). Such imbalances can result in losses that negatively affect performance. In order to overcome problems with demand, service firms can resort to two options: tailoring capacity to fluctuating demand or implementing programs that shape the timing of demand (Lovelock, 2001). Examples of these include alternating the marketing mix, hiring part-time personnel during busy periods and renting or sharing facilities/equipment so as to reduce the capital investment in fixed assets. De Brentani (1989) suggests reducing opportunity costs and high operating costs derived from fluctuating demand levels by introducing new and modified services during low demand periods, as well as creating different service designs during peak seasons.

5 New Service Development

The importance and dynamism of the service sector in our economy has resulted in a need for service firms to better understand what leads to successful new service development. The unique characteristics of services can help one comprehend how services differ from products, but they may also generate challenges that require altered development processes. This leads to the next section, which reviews the NSD literature and describes how these distinct features impact the NSD process.

5.1 New Service Development Models

Although research has determined that a market-driven new product process is the most critical component in achieving NPD success in the services sector (Cooper, Easingwood, Edgett, Kleinschmidt, and Storey, 1994), only a few service companies have implemented a formal NPD process in their developments (de Brentani, 1989, 1991; Griffin, 1997). Moreover, when service firms use a NSD process, it tends to consist of fewer steps than what is used for physical goods, and what seems to be stressed in the literature. On average, NSD processes consist of 3.8 steps, whereas processes for physical products comprise 5.4 steps (Griffin, 1997). It has also been noted that, in developing new services, more emphasis is placed on the front end of the process rather than on the later stages (Griffin, 1997).

Several NPD models, developed specifically for application to services (see table 1) have been proposed in the literature (Cowell, 1984; Shostack, 1984; Bowers, 1989; Scheuing and Johnson, 1989; Terrill and Middlebrooks, 1996). While, the structure of most NSD models is based on the stage-systems and activities recommended for the

development of manufactured goods, NSD models attempt to incorporate and respond to the distinguishing features of services. Thus, as in the case of NPD models, they use as an underlying basis the model developed by Booz, Allen, and Hamilton (1982) but, they adapt some of the specific activities in line with the factors that differentiate services. Only one model, Shostack's model (1977, 1984), seems to focus purely on services and does not use the seven BAH stages as an underlying basis. Shostack (1977, 1984) recommends an approach to designing new services that involves "molecular modeling" and "blueprinting" (to be discussed) to bring order to the process. She advocates that, in order to address the issues of service development, one must build on the strengths of these operational systems and develop a more comprehensible and workable framework. More details on this model are provided in the following section.

Although Bowers' (1989) model is of a formal structure, he finds that most firms make use of a NSD process that is not open to market influences. Consequently, in developing a new service, he suggests a more systematic process that considers external change and includes customer reactions and comments. He also states that aspects such as testing and the difficulty in obtaining patents for new services due to intangibility bring about a need for the development of a model geared specifically for services.

Scheuing and Johnson's model (1989) is perhaps one of the most detailed NSD models. It emphasizes the main factors that affect the design process at both the internal and external level, and reflects the unique circumstances existing in the service sector. For example, because of the inseparability and heterogeneity characteristics, they stress the importance of incorporating frontline personnel in the design phase of the process. This impels frontline personnel to understand the nature and operational features of the

new service. Scheuing and Johnson consider this step to be critical in order for the personnel to fully understand the new service and to avoid delivering services that fail.

Terrill and Middlebrooks (1996) offer a ten-step model of the NSD process, stressing the need for a formal process that is customized to each company's individual NSD scenario. They advocate that several benefits can be derived from customization of the NSD process such as faster development times because of intangibility, greater protection of the new service, and faster experiential learning for modifications due to simultaneity.

Table 1: New Service Development Models
 (Source: Adapted from Ragot, 1994 p.43)

1	2	3	4	5
Cowell (1984)	Shostack (1984)	Bowers (1989)	Scheuing & Johnson (1989)	Terrill & Middlebrooks (1995)
Idea Generation	Service definition	Business Strategy	New Service Strategy	Problem Description
Idea Screening	Information Search & Alternatives	Idea Generation	Idea Generation	Idea Creation
Concept Development and Testing	Draw Boundaries of Service	Concept Development and Evaluation	Concept Development and Testing	Concept Definition
Business Analysis		Business Analysis	Business Analysis	Analysis and Screening
Development	Blueprint	Development	Project Authorization	Concept Design
	Blueprint Analysis		Service design and Testing	Delivery and Operations Test
	Decision to implement		Process and system design testing	
	Implement service (test)		Marketing program, design and testing	
Testing	Pre-Launch marketing Activities	Market Testing	Personnel Training	Broad Market Testing
Commercialization	Market Launch	Commercialization	Pilot Run	Infrastructure Scale-up
	Post-introduction Audit		Test Marketing	Introduction and Launch
			Full-Scale Launch	Postlaunch Check-up
			Post Launch Review	

6 Impact of Service Features on NPD Process

The relative importance of each step of the NSD process, as well as the method in which the NSD process is carried out, is often affected by the distinct characteristics of services (de Brentani, 1989; 1993). In this section, the impact that the unique service characteristics have on each stage of the NSD process for business-to-business services will be discussed.

6.1 New Service Development Strategy

Similar to NPD, service companies find it beneficial to approach the development process using a new service strategy that is based on the firm's overall corporate objectives to guide the NSD team throughout every project (Scheuing and Johnson, 1989; Terrill and Middlebrooks, 1996). Strategic planning consists of tying NSD to the firm's corporate strategy and goals, identifying areas of focus for service development, and verifying that the innovation strategy is articulated throughout the organization (Cooper and Edgett, 1999). The company must identify in its new service strategy the objectives of the project in terms of target market, positioning, and expected financial returns (Lovelock, 2001). Defining the functionality of a new service allows managers to properly allocate resource needs (Terrill, 1992).

Service companies, however, have been known to lack a strategic focus in their new service development and to lack development competencies and appropriate organizational structures (Edgett, 1993; Martin and Horne, 1993; Cooper and Edgett, 1999). An exception to this was found in one study of U.K. financial institutions, where top performing banks appeared to have mastered the launch of new services by

implementing formalized and better structured new service development programs (Johne, and Pavlidis, 1996).

Scheuing and Johnson (1989) identified four basic strategies, which often guide a service company's NSD activities. The first strategy, called "share building", involves organizations in cross-selling. This entails selling a broader array of existing services to existing customers. For example, banks may focus on increasing sales by trying to sell insurance to mortgage clients. The second strategy, called "market extension", implies that firms should focus their efforts on selling existing services to new customers. "Line extension" strategy is the third type of strategy and it involves selling new services to existing clients. Finally, companies can implement a riskier strategy called "new business strategy" where efforts are focused on selling new services to new customers.

6.2 Idea Generation

Idea generation, the second step of the NSD process, is similar to the one used in NPD. In general, service firms describe the step of generating ideas as a task that is relatively easy (Easingwood, 1986). In fact, for new services, Easingwood (1986) recommends that when frontline personnel are involved, they can be used as a source of ideas because they are fairly knowledgeable about customer needs. The inseparability dimension, which results in interaction with customers, especially in the business-to-business sector, provides major opportunities to identify new service ideas (Easingwood, 1986; de Brentani, 1993).

Due to constraints in patenting, more focus tends to be placed on improving existing services and fewer resources are invested in new service innovations. The ease of

copying services has made competitors for many firms the primary source of ideas for new services (Easingwood, 1986; Scheuing and Johnson, 1989; Johne and Storey, 1998). For example, almost 80% of banks perceive their competitors as the main source to generate new service ideas (Johne, and Storey, 1998). Service companies should seek to generate more innovative ideas because it is in their best interest to be innovative. A study conducted on new services revealed that pioneers not only gain sustainable competitive advantage, but they also have a greater chance of outperforming followers in terms of market share (Song, Di Benedetto and Song, 2000).

6.3 Screening and Evaluation

Screening ideas is perceived as an important step in NSD because it allows the organization to identify ideas with the greatest potential for success, early in the process (Edgett, 1994). Moreover, by screening out low potential ideas, human and financial resources are not spent on developing ideas that are likely to prove to be failures (Edgett, 1994). In new service development, however, screening and early idea evaluations tend to be used relatively rarely (Easingwood, 1986; Johne, and Storey, 1998). When they are used, most service firms implement informal screening procedures (Easingwood, 1986, Edgett, 1993).

6.4 Business Analysis

Those new service ideas that pass the screening evaluation pass on to the next step, called business analysis. During this stage, managers try to assess the proposal's financial attractiveness in terms of the likely contributions the new service will make to

the firm. Ideas are developed into concepts, which means that the company develops a clear description of the potential target market as well as a clear definition of the planned new service itself, stating features and benefits it will possess (Scheuing and Johnson, 1989; Cooper and Edgett, 1999).

Market research should be conducted at this stage because it allows a company to identify the attractiveness of the market opportunity. A business analysis is carried out by studying the market, customers, and competitors as well as conducting a financial analysis (Cooper, 1999). Unfortunately, in the development of new services there tends to be a lack of sophistication in the use of market research (Edgett, 1993). This can be partly explained by the fact that a service is intangible and can be quickly imitated, making it difficult to estimate its full potential (de Brentani, 1991). Moreover, since services often involve relatively little, or no, capital investment, there is less motivation to undertake a full business case analysis.

According to Cooper (1999), doing solid up-front homework before the project moves on to development is extremely important to success. Findings indicate that projects where companies do their up-front homework have increased chances of delivering a successful service from 39% to 82% (Edgett, 1996). Cooper and de Brentani (1991) and Cooper (1999) state that there are important differences between successful and unsuccessful projects, in terms of the quality of homework that has been conducted prior to developing the new service. These activities include preliminary market assessment, market research, and business analysis (Cooper and de Brentani, 1991; Cooper, 1996, 1999; Cooper and Edgett, 1999). There are a number of advantages that result from taking the time to do up-front homework. These include: (1) increased

chances for success; (2) reduced time to market, because homework that is carried out well, results in more accurately defined projects and fewer errors in the development process; (3) and earlier anticipation of any problems, before they become too expensive or too difficult to fix (Cooper and Edgett, 1999).

6.5 Development Stage

The development stage for new services has some important differences from what is done for manufactured goods. It involves translating the service idea into a service concept (Cowell, 1984), and then designing the appropriate delivery process and system, the marketing program, and the personnel that comprise the actual service.

The dimension of simultaneity affects the development stage of services. Considering that services rendered by individuals brings about interaction with customers, marketing to service employees to improve their performance is recommended (Berry, 1995; Easingwood and Arnott, 1991; Terrill and Middlebrooks, 1996). Internal marketing should be encouraged in promoting a new service because once a service is rendered by a person it is evaluated by its performance; and its performers are the employees. Consequently, service firms must pay particular attention in the hiring of their personnel. They need to attract and retain qualified employees capable of performing according to company standards (Parasuraman, Berry and Zeithaml, 1991).

Simultaneously, an effective NSD process is required not only to manage the staff that will interact with customers, but the customers themselves. Since the service is aimed at satisfying customers' needs, they should be consulted in the development process and asked to articulate their needs (Cooper and Edgett, 1999). When service

companies have acquired a thorough understanding of consumers' needs, they are capable of conceiving approaches that lead to substantially better solutions than what competitors offer (de Brentani and Ragot, 1996). Essentially, an organization will achieve the delivery of a successful new service if it incorporates customers' inputs in every step of the NPD process (Cooper and Edgett, 1999). This applies to all organizations because one of their most fundamental assets are their satisfied customers (Cooper, 1999).

Variability in service production is another component that must be addressed in the development stage. Firms need to determine the degree of standardization or customization of the service (Valikangas and Lehtinen, 1994; de Brentani and Ragot, 1996). De Brentani (1989) found that firms try to make their services more standardized (i.e., consistency) in the hopes of being more successful. Thus, if a standardized service will be offered, then perhaps the use of equipment wherever possible would be an option to consider in development because it allows for less inconsistency (Valikangas and Lehtinen, 1994). Also, training personnel with proper skills to effectively communicate and interact with customers is necessary to deliver successful services (de Brentani, 1989; de Brentani and Ragot, 1996).

The intangibility component of services allows a company to develop a service more easily and quickly than what is required for a new product (Shostack, 1984; Easingwood, 1986). In some cases, "design" goes on in the service provider's head without much planning (e.g. giving advice). But, if customers are going to try out a new service or switch from a competitor's offering, companies must focus on differentiating their services and help potential customers understand and evaluate the offering. Thus,

service concepts need to be “tangibalized” in order to facilitate internal and external understanding (Terrill, 1992). Considering how consumers often infer the nature of the service from different circumstantial evidence, the design of a service should include the arrangement of physical evidence.

6.5.1 Methods/Models For Designing Services

Molecular Model

Shostack (1977) believes that “market entities are in reality combinations of discrete elements which are linked together in molecule-like wholes” (p.74). Her molecular model (1977) describes the way in which tangible and intangible components of the service are encompassed into the final offering. This model provides opportunities for visualization and organization of the complete market entity. It reveals that a market entity can have both tangible and intangible constituents without decreasing the importance of either one. It allows the marketer to perceive the service based entity as an offering of multiple elements and hence, it can provide insights on how the main service and its surrounding elements should be managed.

Blueprinting Services

Shostack (1984) also introduced the concept of a “blueprint” to help service developers sort out the details of the NSD early in the process. A service blueprint permits a company to investigate all the problems inherent in creating or managing a service. In order to create a blueprint, mapping the processes that make up the service is the primary step. One important aspect to consider is the parts of the service that are not

obvious to the customer, like purchasing of supplies (Shostack, 1984; Grönroos, 1998). Once the processes involved in a given service have been put on a diagram, the designer is then capable of determining where the system might go wrong. Identifying potential failpoints in advance and designing fail-safe processes to deal with these is key to substantially reducing service failures and increasing the perceived and real quality of service offerings (Shostack, 1984; Grönroos, 1998).

Augmented Service Offering (ASO)

Firms can also use a service offering type of innovation to develop their new service. Grönroos (1990) developed the Augmented Service Offering (ASO) model in an attempt to differentiate the firm's service. This model, which was extended by Storey and Easingwood (1998) by further relating it to NSD, consists of three main components: the core service product, the augmented service and the marketing support provided for the service. The "core" service product is the bundle of goods and services that are offered to satisfy customer needs at the most minimal level. The second component, the "augmented" service consists of the additional elements that are incorporated to differentiate the core service from its competitors, such as company reputation. Finally, market support encompasses factors such as training of personnel, internal marketing, and launch strategy. Storey and Easingwood (1998) advocate that all three components are crucial elements of the total service offering such that the core service product cannot exist without the other two. Consequently, all factors affect new service performance.

6.6 Testing

Developers often have the tendency of turning a simple idea that answers a certain need, into an operational concept that hardly resembles the original idea (Shostack, 1984). This occurs because usually there is no testing procedure that is carried out to assure that the service is complete and capable of fulfilling the original need objectively (Easingwood, 1986; de Brentani, 1989, 1991; Edgett, 1994).

Compared to manufactured goods, studies repeatedly show that concept testing, as well as market testing of new services, are not commonly used (Easingwood, 1986; Johne, and Storey, 1998), even though market feedback during NSD is necessary (Terrill, 1992). The purpose of concept testing is to assess whether a prospect comprehends the idea of the proposed service, and whether it satisfies unmet needs (Cowell, 1984; Scheuing and Johnson, 1989). Concept testing should be conducted once the idea has passed through screening (Cowell, 1984). However, when companies actually do carry out testing of their service concepts, they often carry it out in a faulty manner, because it is difficult to create precise concept descriptions of intangibles or to demonstrate new service benefits to potential customers (Johne, and Storey, 1998).

When it comes to market testing a new service prior to launch, service companies also perform poorly. There are several reasons why companies have the tendency to introduce new services without executing any formal testing (Easingwood, 1986). First, they find that financial loss from service failures is low in comparison to the cost of testing. If customers do not want or like the service, the company can simply stop offering it (no unsold inventory) or change, or “recover” the service to fit customer requirements (as will be discussed under launch). Testing is often skipped because

managers find that carrying out complete market testing is often as costly as carrying out a full market launch (Shostack, 1984). Moreover, competitors who have the ease of copying the service, have access to information gathered from the testing procedures (Johne, and Storey, 1998). Therefore, given that intangibility makes services easily duplicatable, it is perceived as an unwise decision to allow competitors to know of an upcoming new service because you reduce the chances of gaining benefits from being the first-to-market the new service (Shostack, 1984; de Brentani, 1989; Barczak, 1995; Terrill and Middlebrooks, 1996). According to Scheuing and Johnson (1989), two more reasons may explain why service organizations bypass testing: either the new service has the purpose of completing a product line or it is an imitation of a competitor's service offering and doesn't really require testing.

The simultaneity feature of services can also affect testing, because service companies often forego testing since they can rely on post-launch service recovery methods. Many service firms treat the launch a bit like the testing phase, making changes to the service in response to customer unmet needs or complaints. This implies that customer dissatisfaction can be managed, or potential service failures can be "recovered" by empowering employees to handle problems that are encountered with the service. Research has demonstrated, however, that new services that were tested prior to commercialization were associated with a higher level of success (de Brentani, 1989, 1991; Edgett, 1994; Terrill, 1992).

The use of testing prior to market launch is widely advocated not only because it is easier, but also because it is cheaper to rectify mistakes in the design of a service and its support systems during this stage, as opposed to after a formal launch (Shostack,

1984). Once the testing stage has been completed, management has a better picture as to what to expect under full-scale marketing and therefore can make a more informed decision about commercializing the new service.

6.7 Commercialization

Commercialization of new services involves similar activities as those outlined for new products. Studies have shown that firms that implement a NSD process, which includes a well thought-out launch, have a greater chance of attaining success (de Brentani, 1991; Edgett, 1996). Unfortunately, service firms often develop and launch new services too quickly without verifying that the offer complies with customer needs and functional specifications (de Brentani, 1989).

When launching a new service, customers will look for signals of service quality considering that there is no tangible evidence to connect the service to the company. It is therefore recommended that the company's reputation for expertise and performance be associated with the service to overcome the problem of intangibility (de Brentani, 1991; de Brentani and Ragot, 1996). The communication tools the firm will use to create awareness of the new service should be established before launch. One important aspect that must not be overlooked is internal marketing. Employees, particularly frontline personnel, must be trained prior to launching the new service. They should be provided with information on the benefits, features, and functions of the service, and they should be taught how to adapt or customize the service to individual customer needs (Terrill and Middlebrooks, 1996).

Once the new service has been introduced to the market, the firm must continuously assess its performance (Shostack, 1984; Scheuing and Johnson, 1989; Terrill and Middlebrooks, 1996). A post-launch review is deemed necessary in order to determine if the new service is meeting the strategic objectives and complying with customer needs (Scheuing and Johnson, 1989). Sometimes, services may not live up to customer or company expectations, and thus firms must be able to recover from breakdowns. This is where the concept of service “recovery” comes into play. The intangible and simultaneous nature of services can have a positive impact on commercialization by allowing the frontline personnel to deal with problems that arise during service delivery (Terrill and Middlebrooks, 1996). When obtaining a service that requires interaction with personnel, these two characteristics allow personnel to get immediate feedback, and thus, make adjustments accordingly that can reduce failure during launch (Scheuing and Johnson, 1989). Therefore, by developing and implementing formal guidelines, firms can empower their frontline personnel to identify and rectify service failures, to ensure that customers remain satisfied (Tax and Brown, 1998).

Effective service recovery programs usually include the following: they encourage customers to voice their dissatisfaction; verify that customers’ complaints are handled fairly and promptly; and finally, documenting all complaints is recommended (Tax and Brown, 1998). Some services, even if they have been carefully developed, can prove to be failures due to uncontrollable circumstances. Consequently, service recovery programs should be developed and employees trained to react appropriately to the most likely service delivery failures (Terrill and Middlebrooks, 1996).

7 Performance

When a company undertakes a NPD effort, it must also evaluate the new product or service's level of performance in order to determine if it is meeting company objectives. Firms are known to use approximately four different financial and non-financial criteria to assess their performance (Griffin and Page, 1993). Griffin and Page (1996) note that performance should not be assessed with only one criterion. Rather, the use of several performance factors to evaluate performance is recommended. This means, however, that given the number of different criteria to choose from, managers must often forego some level of success on one dimension in order to be successful on another.

Cooper and Kleinschmidt (1987) describe three dimensions of performance. The first one, called "financial performance", measures the level of profitability, the payback period, and relative profits to sales. The second one, titled "Window of Opportunity", describes the extent to which the new product opens up new product and new market opportunities. "Market impact", the last dimension of performance, measures domestic and foreign market share.

De Brentani (1989) discovered four distinct performance factors that service companies tend to use, namely: sales and market share performance, competitive performance, other booster, and cost performance. She found that each of these dimensions describes a unique approach in measuring the success or failure of a new service project. In yet another study of new financial services Cooper, Easingwood, Edgett, Kleinschmidt, and Storey (1994) grouped fourteen measures of performance into three basic dimensions: financial, relationship enhancement, and market development.

Cooper and Kleinschmidt's (1995) study on new product *program* performance was measured using ten different criteria. These included: success rate, percent of sales, profitability relative to spending, technical success rating, sales impact, profit impact, success in meeting sales objectives, success in meeting profit objectives, profitability relative to competitors, and overall success. Given that this thesis will also evaluate program performance, the measures used in Cooper and Kleinschmidt's study will be briefly described. "Success rate" measures the percentage of projects that were developed and were regarded as commercial successes. "Percent sales" evaluates performance of NPD programs by assessing the percentage of sales that were derived from the new products that were introduced over a given period of time. "Profitability relative to spending" describes the profitability of the firm's new product program relative to its expenses. "Technical success rating" measures performance by evaluating the rated technical success of the program compared to its spending. The next performance criterion, "sales impact", measures the impact of the new product program on the firm's sales over a given period of time. "Profit Impact" evaluates the effect of the new product program on the company's profits over a certain period of time. The next performance measure is called "success in meeting sales objectives" and it assesses the extent to which the firm's new product program is successful in meeting company objectives. "Success in meeting profit objectives" is the same as the previous measure except that it evaluates success against profit objectives. "Profitability relative to competitors" describes how the company's program performed relative to its competitors. The last performance criterion, "overall success" evaluates the overall rated success of the program vis-à-vis competitors.

Griffin and Page (1996) suggest that the most appropriate way to measure program performance depends on the innovation strategy used by the organization. For example, if the company has a strategy of a proactive nature whereby it is important for it to be a pioneer and be first in new markets with new technologies, then performance would more likely be assessed with measures such as “percentage of profits and sales derived from products less than n years old” as well as the “degree that today’s products have led to future opportunities”. However, if the company is of a more reactive strategy, whereby it responds only when forced to by strong environmental pressures, then performance measures such as “success rate” and “return on product development program investment” are recommended.

De Brentani and Kleinschmidt (2000, 2001), in their study of international NPD for both manufactured goods and services, determined five constructs for evaluating NPD program performance. They also found that all five dimensions were significantly linked with profitability, which is usually the ultimate objective of every firm. Their first construct, “financial performance/impact”, includes evaluation criteria such as sales impact, meeting sales objectives, technical success relative to spending, meeting budget, and profitability relative to spending. The second one, called “competitive performance”, incorporates measures such as relative profitability, overall program success versus competition, and overall program performance in international markets versus domestic markets. The third dimension, “success rate” describes performance in terms of the percentage of commercial successes the firm has experienced, the percentage of unknown outcomes, and the percentage of sales from international NPD. The next construct, “time efficiency”, evaluates programs on whether they were launched on time and efficiently in

all markets. Finally, “window of opportunity” evaluates the performance of programs by assessing whether the international programs opened new (market, product and technology) opportunities for the firm.

The vast majority of NPD/NSD studies show that firms usually use a mixture of financial and non-financial criteria to assess their performance. Consequently, for this particular study of international new service development, the measures determined by de Brentani and Kleinschmidt (2000) will be used to evaluate the performance of new service programs: “Success Rate”, “Sales Impact”, “Spending on Budget”, “Profit Returns”, and “Window of Opportunity”.

IV GLOBALIZATION

1 Importance of Globalization in NPD

According to Devinney (1995), globalization is defined as “the opening of new opportunities that are represented by the opening of new customer markets and the availability of new production opportunities” (p. 71). Thus, in today’s competitive world, in order to be successful, a firm’s NPD program must increasingly have a global focus. When attempting to define a market, the firm should consider the world to be a market with various segments (Urban, and Hauser, 1993; Golder, 2000). Some firms perceive the world to be their market (e.g. Visa) and, therefore, are considered to be “truly global” because they function in all four hemispheres (Lovelock, 2001). Other companies consider their markets to be different one from another and consequently new services are adapted to meet the dissimilar needs (McLaughlin and Fitzsimmons, 1996)

Most organizations, however, continue to have country-based management structures (Golder, 2000), despite the fact that a company’s ability to succeed in the long term is increasingly dependent on its capacity to achieve economies through growth potential, and on the competitive advantages obtained from successfully infiltrating international markets (Ohmae, 1989; Cooper, and Kleinschmidt, 1990). Success is dependent on effective and efficient communication in international new product³ development teams, and on formal structures that are parallel, across the international divisions (Moenart, Vaeldries, Lievens, and Wauters, 2000). Thus, while considering differences in markets, when developing new products for international markets, it is

³ *The term “product” hence (NPD) is used generically and can stand for either manufactured goods or services*

recommended that companies select a more centralized approach to introduce their new global products (Devinney, 1995).

2 Globalization and Services

Although globalization is occurring in most industries and at all levels, globalization of services, particularly in the industrial sector, is a fairly recent phenomenon. This may be explained by the fact that service companies may experience greater difficulty in expanding internationally, considering that they need an actual facility and people in order to deliver and produce the service, as opposed to the manufacturing sector whereby if a product fails in one area, it can always be exported and sold elsewhere (Samiee, 1999). The deregulation of markets, however, has brought about an increase of competition at the international level for many services (Johne, and Storey, 1998; Knight, 1999; Lovelock, 1999; Samiee, 1999). For instance, financial institutions not only have to deal with the local market but they are constantly affected by international competition and their offers. Free trade legislation (e.g. NAFTA) and the European Union have also contributed to transnational operations (Knight, 1999; Lovelock, 1999). Thus, the reduced barriers to entry instigate firms to seek expansion of their service operations to other countries (Knight, 1999).

According to McLaughlin and Fitzsimmons (1996) and Lovelock (2001), there are several reasons that drive service firms to seek their fortunes in foreign markets. Expanding sales is one reason because they may have depleted growth opportunities in their domestic market. Following competitors and customers are identified as two additional motives for pursuing globalization, particularly in the business-to-business

sector where customers may request to be followed by the service providers because they often prefer standardizing the services they utilize. For example, a company may request that the accounting firm in its domestic market provides accounting services that have consistent worldwide approaches (Lovelock and Yip, 1996). Building expertise is recognized as yet another reason. Some countries are considered to be experts in certain industries (e.g. Finland leads in the mobile phone industry; Canada leads in Railway logistics and oilrig consulting) and thus, firms may enter those lead countries in the hopes of gaining experience and expertise that can then be utilized in their domestic market, and opportunities to offer highly specialized services, worldwide. The last explanation given for pursuing globalization is that, if a firm is the first to enter the new market, it has the potential of achieving a competitive advantage (McLaughlin and Fitzsimmons, 1996; Lovelock, 2001).

This trend of expanding services globally is not only a result of firms taking advantage of major opportunities, but also of the advancements in communication and information technology. This has brought about ease in internationalizing services since the requirement of a physical presence is less necessary (Erramilli, 1990, 1992). Technology advances permit companies to communicate quickly with their customers and within the organization (McDermott, Kang, and Walsh, 2001). Moreover, these advances in IT (information technology) allow for a more effective and efficient transfer and analysis of information within the firm. In essence, the advent of technology enables companies to function and compete, worldwide (Knight, 1999). For example, the Internet permits companies to look at offers given by global competitors. Organizations that do business at the international level are known to communicate internally by using

means such as the e-mail, the Intranet, and videoconferencing. Also, Dahringer (1991) advocates that making use of technology to support the design and delivery of the new service should greatly assist the company in successfully introducing it to global markets.

In order to achieve successful expansion at the international level, establishing a successful new product program that is aimed at this much broader market arena is paramount (Devinney, 1995). The concept of globalization, however, also brings about major difficulties when developing new products/services, such as: creating offerings that meet the needs of many different market segments, while still providing economies of global scale (Levitt, 1983); communicating across functional and cultural lines (Chiesa, 1996, 2000; Moenart et al., 2000); effectively exploiting skills and technologies found at the international level, and developing NPD strategies that embody goals and resources at the global level (Devinney, 1995; Gilmont, 1995; Chiesa, 2000). It has been reported that many companies that operate in more than one country do not implement a coherent international strategy. Often, the firm perceives each country as a different entity with hardly any strategic link to the domestic market or to that of other countries (Devinney, 1995; Lovelock, 2001). Although it is complex to carry out a NPD process for the global market, it is necessary to ensure the company's long-term survival.

The marketing mix for the development of physical products consists of the famous four P's: product, price, promotion, and place. In service marketing, however, three additional components must be considered because of services' unique characteristics. These include the people, physical evidence, and the process (Nicoulaud, 1980). Hence, the task of international marketing becomes even more complicated due to this extended marketing mix.

Nicoulaud (1980) advocates that international marketing is dependent on several principles. First of all, when companies seek to launch their services in markets other than their own, they are encouraged to employ similar stages of market development as well as parallel competitive strategies from one country to the other. Secondly, analogous markets must also be targeted in global marketing. Finally, the service must be introduced to customers whose needs, desires and intentions on using the service are comparable.

The intangibility characteristic of services requires that service firms focus on building strong corporate images, particularly in international marketing (Dahringer, 1991). The internationalization process of services is much more risky and complicated than that of physical goods, because service companies do not enjoy the same opportunities of becoming more knowledgeable through a gradual approach to entering foreign markets as manufacturing firms do (Nicoulaud, 1980). Manufacturers can start slowly and on a limited basis by first exporting their domestic products and gradually increasing their commitment to the global scene. In contrast, service firms typically must set up entire operations in local markets in order to provide a full service to clients. Thus, international service marketers are required to gather information and study potential buyers in the countries under consideration carefully. Specifically, they must fully comprehend potential customers' perceptions and understandings of the service and its utility (Nicoulaud, 1980). Extensive market research is crucial for the successful launch of international service offerings (Knight, 1999).

Inseparability, another unique characteristic of services, makes the task of launching a service internationally even more difficult (Nicoulaud 1980; Dahringer,

1991). Considering the large number of employees a company must hire when operating in many countries, it is strongly recommended that sophisticated recruitment and training techniques be used to ensure the development and selection of service suppliers whose competence will lie in both protecting the corporate image and in designing and delivering the service (Nicoulaud, 1980). Finally, the characteristic of heterogeneity can make global service standardization, and quality control a major challenge for firms (Dahringer, 1991).

3 Applying Hofstede's Dimensions of National Culture

Nakata and Sivakumar (1996) believe that NPD process of products and services must be correlated to Hofstede's (1980) four dimensions of national culture. These include individualism, power distance, masculinity, and uncertainty avoidance. With globalization, firms must consider differences between cultures. Examples of these include language, values, and collectivist versus individualistic environments, which is Hofstede's first dimension. Employees working in Canada, for instance, will be substantially different from those in Japan (Nakata and Sivakumar, 1996). Consequently, the NPD process must account for such differences in order to be able to effectively communicate at the global level.

Power distance, the second dimension, is "the extent to which less powerful members of organizations and institutions accept and expect that power be distributed unequally" (Hofstede and Bond, 1988, p.10). This can have a tremendous effect on the type of managerial approaches that are implemented. Countries such as Mexico, India, and France are considered to be more tolerable of inequality and authority than low

power distance societies such as Canada, Australia, and Israel (Hofstede, 1980). Therefore, in later stages of the NPD process such as development, testing, and launch of the service, where further control is required to ensure successful delivery of a new service on time, environments of high power distance are preferred (Nakata and Sivakumar, 1996).

A society can also be described as being assertive or nurturing, which are two aspects of masculinity, the fourth dimension of Hofstede's (1980) framework. Countries such as Germany, Italy, and Venezuela are perceived as more assertive (i.e., more masculine), as they are considered to place greater importance on achievement, tasks, money, and performance (Hofstede, 1980). Societies viewed as feminine such as Sweden, Thailand, and Spain focus on people, the quality of life, and helping others (Hofstede, 1980). Greater levels of masculinity support the NPD process, because when undertaking a new project, having clear objectives, assigning tasks, and following formal guidelines contributes to high performance (Nakata and Sivakumar, 1996). However, low masculinity may be a great trait to be present during the steps of idea generation and screening and evaluation. Therefore, as with the dimensions of individualism and power distance, careful attention must be placed on which approach would yield most optimal results given the extent of masculinity present in the organization.

The method used by societies to cope with unknown aspects of the future defines the last dimension, called uncertainty avoidance. Countries classified as low on this dimension generally work to meet basic needs, are more liberal, and feel more secure (Hofstede, 1980). Examples of such countries include the United States, Canada, and Singapore. Conversely, societies who are apprehensive about what the future holds (such

as France, Greece and Portugal) actively avoid risk by enforcing laws and social plans that create a sense of control (Nakata and Sivakumar, 1996). This particular dimension of national culture has received little attention with respect to its impact on NPD. However, the little research that has been conducted insinuates that the association between NPD and uncertainty avoidance may be understood in terms of two aspects namely, planning and risk aversion (Nakata and Sivakumar, 1996). Planning can be beneficial in high uncertainty avoidance situations, especially in later stages of the NPD process. Regarding risk, during the initial stages it is recommended that risk-seeking behavior be adopted, whereas in later stages of the NPD process a more risk averse behavior should be encouraged (Nakata and Sivakumar, 1996).

These four dimensions clearly indicate that depending on how each country ranks on each of the dimensions, some cultures may perform better than others in certain phases of the NPD process (Nakata and Sivakumar, 1996). A recommendation might be to select countries that are most likely to perform well in the first few phases alongside countries that are inclined to perform better in the later stages of the NPD process (Nakata and Sivakumar, 1996). This might benefit a company because it rests assured that it possesses the full range of skills needed to execute the whole process.

4 Implications of Teamwork

Globalization and the accelerating rate of advancement in technology have put pressure on the development process to design and commercialize new products and services of superior quality. Consequently, one out of every five NPD teams are composed of members who are both from different countries and different cultural

backgrounds (McDonough, Kahn, and Barczak, 2001). The cross-functional team is often the solution for an effective development process of a new product or service (Johne and Storey, 1998). This allows for the development phases to occur concurrently and thus, increase the pace of product development. However, an appropriate fast pace only occurs if effective integration of the units is achieved (Hitt, Nixon, Hoskisson, and Kochhar, 1999). Once integration is properly executed and information is shared concurrently, the cross-functional team is known to produce fewer amounts of rework, redundancy, and inappropriate activities (Bishop, 1999).

When integrating two or more cultures, Nakata and Sivakumar (1996) recommend three approaches in designing a new team, which capitalizes on the strengths of each culture. The first one is to organize cultures with respect to their strengths. This implies that cultures strong on the initial stages of the NPD process would be assigned to tasks of those stages and vice versa for companies who are stronger on later stages of the process and are perceived as collectivistic, masculine, and high in power distance and uncertainty avoidance. In the second method, several employees from each culture are gathered to form a new product team. The same employees are kept throughout the entire process, with the exception of the leader who is replaced halfway through the project. The last approach is similar to the second one with the exception that the leader also sees the project through from idea generation to the introduction of the new service. These methods may also bear negative consequences, such as problems with readjusting to new leaders, working with people from different cultural backgrounds and so on. Firms must realize that even though some core NPD management principles may be applied to all cultures, others necessitate adjustment for cultural variations and thus, managers involved

in teams with members from different countries must familiarize themselves with the different cultures (Souder and Jenssen, 1999).

5 Mode of Entry

Once an organization has decided to expand internationally it must carefully select a mode of entry in the foreign market by which it will launch its new product or service. This is deemed as one of the most important decisions to be made by firms seeking globalization of their products and services (Erramilli, and Rao, 1993). Therefore, companies wishing to introduce their new service to the foreign market must take into consideration the type of strategy that will be implemented. They can use a *transnational* strategy, which entails that the same NPD process be used across all countries as employed in the domestic market, or they can use *multilocal* strategies, which involves using a different NPD process for every market of each country (Lovelock, 1999, 2001). When a company selects a transnational NPD process as a mode of entry, cross-functional teams with members from different countries, as well as collecting information from several foreign markets to build a global service, is recommended (Cooper and Edgett, 1999). There are a few factors that appear to affect the adoption of a transnationally integrated strategy to introduce new services to the global market. These include market drivers, competition drivers, technology drivers, cost drivers, and government drivers (Lovelock and Yip, 1996; Ju Choi, 1999). For example, possible market drivers that might inspire a company to adopt transnational strategies include common customer needs across the different markets, customers who insist on having consistent service worldwide from the domestic supplier, as well as the

accessibility of international channels via electronic networks. Government drivers that may encourage the move toward globalization include favorable trade policies, and common market regulations (Lovelock and Yip, 1996). Verhage, Dahringer and Cundiff (1989), however, advocate that a single international strategy for all global markets may not be the best option, especially in yielding optimal sales performance.

Tai and Wong (1998) conducted research on decision making in the advertising industry on companies that have expanded globally. Although, the current study is analyzing the business-to-business service sector, decision-making concepts may also be highly applicable when analyzing this sector. When a firm wishes to extend its business globally, Tai and Wong (1998) recommend an approach called “Glocal”, which is derived from an amalgamation of the words **global** and **local**. It refers to thinking globally but developing and implementing new projects locally. It consists of making use of a decentralized process while still using a standardized approach to develop a new product for the international market. Companies that adhere to a “Glocal” strategy usually employ a limited decentralized process, whereby headquarters permits its subsidiaries to make their own decisions, but local offices still make use of a standardized strategy. This approach allows the subsidiaries to recognize changing needs more effectively without depending on the headquarters’ approval.

Lovelock (1999, 2001) believes that the method in which the firm selects to enter the international market is contingent on the nature of the underlying process and the delivery system. If the service is a people-process service where customers physically enter the service “factory”, and are present throughout the service delivery to derive the benefits of the service, then modes of entry consist of exporting the service concept by

establishing a service factory in another country, importing customers, or transporting customers to new locations (Lovelock, 1999, 2001). Possession-processing services, which consist of tangible actions to goods and other physical possessions owned by the customer, call for an ongoing local presence. Finally information-based services, such as banking and consulting may be delivered to the international market in four ways: export the service to a local service factory; import customers; transform the service into a physical good and then export it; and export the information via telecommunications and transform it locally (Lovelock, 1999, 2001).

On the other hand, Valikangas and Lehtinen (1994) state that mode of entry in the international market can be affected by the type of service the company is providing: customized vs. standardized service. If the service offered is of a standardized nature, then “the differential advantage is likely to be sought in international consistency and cost efficiency of a service performance” (Valikangas and Lehtinen, 1994, p. 79). International marketing of a standardized service can target a broad and even an unsegmented market, because marketing themes are standardized. Such services are usually made available to customers via multitude service production networks. Contrarily, international customized services are developed around the needs of the target customer. Marketing these services requires constant interaction with customers and involves creating relationships with clients (Valikangas and Lehtinen, 1994). Customization at the international level is made possible due to advances in IT, which allows for instantaneous transfer of information at the individual level (McDermott, Kang and Walsh, 2001).

6 Impact of Globalization on NPD and NSD

Recently, NPD in both goods and services has expanded to the international level because corporate success is increasingly affected by the ability to sell to global markets. The recent movement towards globalization has made the internationalization of the NPD effort a major concern (Chiesa 2000, 1996). To date, the research in this area is mostly exploratory, focusing on specific industries (i.e., financial, insurance) and lacking strong theoretical bases (Knight, 1999).

Marketing a new service for a completely new market can be quite difficult (Golder, 2000; de Brentani 1991), requiring a well-implemented new product/service program, with a well-structured NPD process (Song, Di Benedetto, and Song, 2000). However, no study thus far has looked at the NPD process and its affect on performance in a company's international new service program. Consequently, de Brentani and Kleinschmidt (2000) are currently undertaking a benchmarking study to identify the determinants that explain performance for the international NPD/NSD program of firms. Pilot studies have demonstrated that a key set of factors impacting performance involve the NPD process. Thus, the thesis described here is part of a much broader research project that focuses on the global new product and service program of firms in the business-to-business sector. The purpose of this thesis is to study the NPD process used by firms when developing new services for international markets, and to provide insights about what factors are essential for achieving success in the global NSD program of firms.

7 Conceptual Model

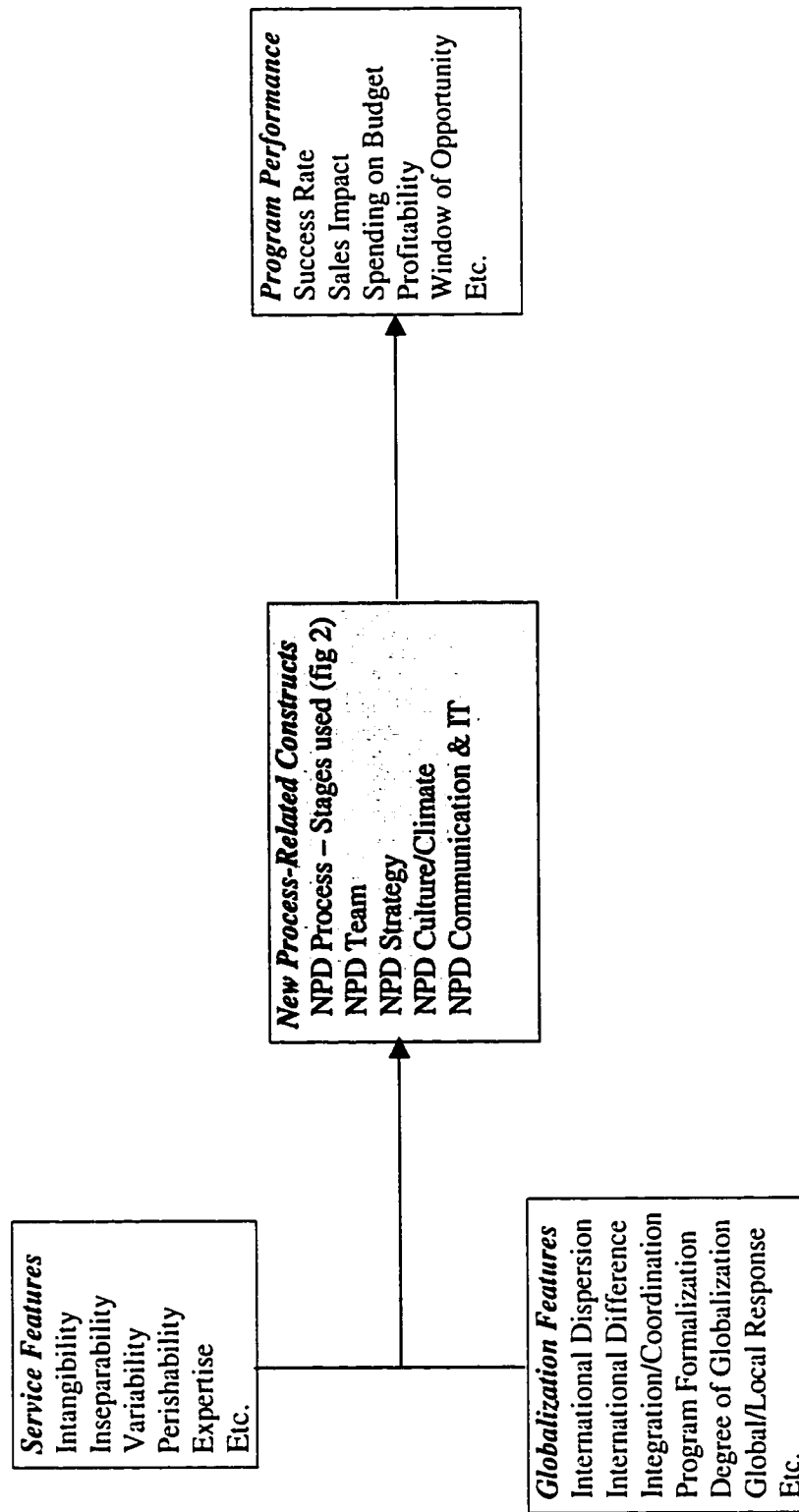
To develop a conceptual model of NPD performance for new service development for global markets, the initial five-factor benchmarking model proposed by Cooper and Kleinschmidt (1995) (see p. 35) was used as a basis. This model was adapted and expanded by integrating the literatures of new product/service development/performance, services marketing, and globalization. This thesis focuses on the NPD process used for global new services. Therefore, a set of five process-related constructs, believed to impact new service development outcomes were used, including: NPD Process (stages used)(Booz, Allen and Hamilton, 1982; de Brentani, 1989, 1991; Cooper and Kleinschmidt, 1987, 1990, 1991, 1995; Griffin, 1997), NPD Team (Sniezek and Henry, 1989; Cooper and Kleinschmidt, 1995; Denison, Hart and Kahn, 1996; Chiesa, 1996, 2000; Uhl-Bien and Graen, 1998), NPD strategy (Scheuing and Johnson, 1989; Devinney, 1995; Terrill and Middlebrooks, 1996; Cooper and Edgett, 1999; Lovelock, 2001), NPD Culture/Climate (Nicoulaud, 1980; Nakata and Sivakumar, 1996), and NPD Communication and Technology (Dahringer, 1991; Knight, 1999; McDermott, Kang and Walsh, 2001).

These NPD process-related factors, themselves are composed of several variables that are believed to impact the performance of a firm's international new service development program (de Brentani, and Kleinschmidt, 2000). The NPD Process is comprised of variables such as the quality of execution of the NPD activities (Cooper and Kleinschmidt, 1995), reduction of haphazardness in the process (Shostack, 1984), and the integration of internationally dispersed information and activities (Devinney, 1995; Nakata and Sivakumar, 1996). The NPD Team, the second factor, incorporates aspects

such as how the program team is organized (Cooper and Kleinschmidt, 1995), the training of the frontline personnel (Easingwood, 1986; de Brentani, 1989), and the global nature of the organization (Denison, Hart and Kahn, 1996; McDonough, Kahn, and Barczak, 2001). The third factor, NPD Strategy involves the extent of formalization of the organizational structure (de Brentani, 1995; Cooper and Kleinschmidt, 1995), the level of expertise necessary to standardize the quality of the services rendered by the providers (de Brentani and Ragot, 1996), and the degree of globalization of new service development (Nicoulaud, 1980). The NPD Culture and Climate deals with the firm's internal innovation culture (Cooper and Kleinschmidt, 1995), the extent of involvement by senior partners (Bailey, 2000), and encouraging openness and involvement across globally dispersed units (Nicoulaud, 1980; Nakata and Sivakumar, 1996). Finally, NPD Communication and Technology includes the level to which technology is used to communicate globally (Dahringer, 1991; McDermott, Kang and Walsh, 2001) and the extent to which the service is technologically based (Lovelock and Yip, 1996).

In the new service development chapter, financial and non-financial criteria to assess program performance were described. In this thesis, the following performance measures will be used to evaluate service programs: "Success Rate", "Sales Impact", "Spending on Budget", "Profit Returns", and "Window of Opportunity". Therefore, the questions in this study are: (1) what are the dimensions that describe the NPD process used or developing business-to-business services for global markets, and (2) how do these global NSD process dimensions impact performance? Figure 3 presents a conceptual model.

Figure 3: Global New Service Development Program Performance



V RESEARCH METHODOLOGY

1 Overview

The objective of this study is to determine the impact that a set of factors that describe the NPD process have on global new product performance for firms in the industrial services sector. The basis for this study is the major empirical research undertaken by de Brentani and Kleinschmidt (2000, 2001). The data for their study was collected using a self-administered questionnaire that they developed and tested, based on an integration of the literatures pertaining to NPD/NSD, New Product Programs, Services Marketing and Globalization. In order to answer the questions, participants were asked to refer to their global NPD program, which consisted of all NSD projects directed at international or global markets that had been carried out over the last three years. The de Brentani and Kleinschmidt (2000, 2001) study comprises a total of 263 service and manufacturing organizations in the business-to-business sector from different industries. Many of these firms had headquarters in Canada, although a large number were Strategic Business Units (SBU) located in Canada whose headquarters were located in the U.S.A. or in other countries. A key criterion for inclusion in this sample was that the firm was actively involved in developing new products or services for the international market. For the vast majority of these firms, “international” market meant at least two or more countries outside of Canada.

The questionnaire dealt with a broad range of NPD issues that were hypothesized, as per the literature, as activities and factors that potentially impact corporate performance. It covered issues such as the firm’s new product strategy, the NPD process, project team’s, innovation culture and climate within the firm, corporate commitment to NPD, communication and technology, as well as several measures of corporate

performance. A subset of the questions (a total of 46 items) relate specifically to the NPD process companies use for developing new products/services for global markets. The specific items used are based on the NPD/NSD process literature—with adaptation for services and globalization—as described in chapters three and four (see also de Brentani and Kleinschmidt, 2000, 2001). For all variables comprising the questionnaire, Likert-type scales were used with values ranging from 1 (strongly disagree) to 7 (strongly agree).

Because the objective of the research is to relate NPD program activities to the firm's eventual performance in this endeavor, the questionnaire also included several metrics for measuring program outcomes. In total, 21 dependent variables—measuring a variety of performance results (as per Griffin and Page, 1993; Cooper and Kleinschmidt, 1995)—were used in the questionnaire including: success rate, percentage of unknown outcomes, percentage of global annual sales, percentage of all annual sales, sales impact of global NPD program, success in meeting sales objectives, spending relative to technology, spending on budget, profit returns, success in meeting profit objectives, profitability relative to competition, cost savings, window of opportunity in terms of new markets, new product arenas, and new technologies, launch on time, lateness of launch, roll outs on schedule, overall performance relative to competitors, overall performance of domestic versus international markets, and lastly overall speed of NPD/NSD. For the purpose of the thesis research, analysis of the performance measures was limited to five variables, which are commonly used and which offer reasonable breadth to the question of NPD performance (Cooper and Kleinschmidt, 1987, 1995; de Brentani, 1989). These include “Success Rate”, “Sales Impact”, “Spending on Budget”, “Profit Returns”, and

“Window of Opportunity”. The first variable, namely “Success Rate”, was measured by asking participants to think about the program of international new service projects over the last three years, and to provide the percentage with regard to success rate. The remaining four dependent variables required participants to answer questions using a seven point Likert scale.

2 Data Collection

The full data set of the de Brentani and Kleinschmidt (2000, 2001) study consisted of 263 firms from both the services and manufacturing sectors. In order to get firms to take part in the study, managers were contacted by phone and asked if they would respond to the questionnaire. Once managers gave their consent to participate, a copy of the questionnaire was sent to them via e-mail. A brief description of the research project was provided and absolute confidentiality pertaining to any company-specific data was assured. Frequently, once contact was made with larger, multi-divisional firms, more than one potential respondent was accessed. In larger firms, respondents held positions such as Managers of Business Development, V.P. of Marketing, V.P. of Technology, V.P. of Global Development, and Director of Marketing. In smaller firms, typical positions held by participants included C.E.O, President, and V.P. of Business Development. Follow-ups consisted of telephone and e-mail encouragements. The full data set was collected over approximately one year and represents a response rate of 35%.

In order to carry out this thesis, the first step consisted of creating a sub-sample from the above database by taking into consideration only service firms. De Brentani and

Kleinschmidt's (2000, 2001) study comprised companies that belonged to a wide range of service industries (see table 2), including: financial, aeronautics, engineering, management and marketing consulting, transportation, communication, computer and system service firms, and so on. Sources used to identify these organizations included the Concordia University Alumni, McMaster University Alumni, ROB 1000, and lists from Dunn and Bradstreet and from the Export Development Corporations.

Thus, the sub-sample consisted of 105 managers from a broad range of service companies that undertook new service development for purposes of maintaining, entering or expanding in international/global markets. Participants had a sound knowledge of their company's NSD program and process. Some firms functioned with only one NSD program for all services and markets, whereas others managed several service/market segments using autonomous divisions called Strategic Business Units (SBU), where each unit often had a different approach to NSD and strategy formulation.

Table 2: Industry of Survey Respondents

INDUSTRY	NUMBER OF RESPONDENTS
IT Systems and Services	18
Aeronautics	15
Management Consulting	14
Financial/Insurance	10
Transportation	10
Engineering Consulting	9
Environmental/Energy	8
Architecture	4
Telecommunication	3
Contract Services/Research	3
Other	11
Total	105

3 Interviews with company managers

In addition to the objective survey, ten personal interviews were conducted by the researcher in the form of mini case studies. Considering the importance of the global component in this study, and the importance of gaining insights about different types of industries, personal interviews were carried out not only in Montreal, but also in Toronto, where companies are much more exposed to and involved with the international market arena. This was done, in order to obtain anecdotal and qualitative information that would further elucidate and enrich the data analysis outcomes. These exploratory interviews allowed the author to acquire a greater appreciation for new service development through field research.

The companies involved in the qualitative analysis were from the following industries (see table 3): transportation, accounting, engineering, financial, insurance, telecommunication, management consulting, pharmaceutical consulting, and environmental consulting. In each of the interviews, respondents agreed to have the discussion taped, after assurances of confidentiality were provided. Interviews typically lasted for approximately one hour. Interviewees were asked to describe the NSD process and activities that the company had been carrying out over the last three years when developing new services for international markets (see appendix A for interview guide). Questions also dealt with how the process was carried out and included topics such as: the NSD global strategy, the project team, the innovation culture of the organization, and the use of communication and technology in NSD. The information gathered in these case studies helped the researcher to develop a better understanding of the issues and provided her with insights about practices in international innovation.

Table 3: Description of Interview Participants (see appendix B)

COMPANY	INDUSTRY	POSITION OF RESPONDENT	NUMBER OF EMPLOYEES	HEADQUARTERS/ INTERVIEW SITE
Company A	Transportation	Director of Special projects	25 000	Canada/Montreal
Company B	Accounting/Consulting	Manager	95 000	United States/ Montreal
Company C	Environmental Engineering/Consulting	Vice-President	7	Canada/Montreal
Company D	Telecommunication	Director of Marketing	50	Canada/Montreal
Company E	Engineering/Consulting	Executive Vice-President	6300	Canada/Montreal
Company F	Pharmaceutical Consulting	Vice-President	100	England/Montreal
Company G	Financial Consulting	Director of International Marketing	51 000	Canada/Toronto
Company H	Insurance/Financial	Vice-President, International Marketing	30 000	Canada/Toronto
Company I	Management Consulting	Partner	300	Canada/Toronto
Company J	Insurance/Financial	Director of Strategic Management	50 000	England/Toronto

VI ANALYSIS & RESULTS

1 Overview of Analysis

When developing new products for markets, the steps and activities companies follow in their new product development process, are hypothesized to impact performance. As shown in chapters two and three, the use of a formal and well-executed approach has been established as a key success factor in the NPD literature. In order to adapt this broad hypothesis to the scenario under study in this thesis, the factors that distinguish services from manufactured goods as well as those describing globalization were incorporated. This was shown in some detail in the conceptual model underlying this study (see figure 3).

In order to test the conceptual model, two broad forms of analyses were undertaken. The first one, the *descriptive* analysis, consisted of carrying out factor analyses and Cronbach alpha in order to reduce the large number of descriptive variables to a smaller more manageable set of composite dimensions. The second form of analysis, called the *relational* analysis, attempted to determine links between the factors that describe the global NSD process with the performance of global NSD programs of firms. The relational analysis was done in three ways —Pearson correlation, regression, and winner vs. less successful t-test analyses—and will be described in more detail in section 3 of this chapter.

2 Descriptive Analysis

In total, there were 46 descriptive variables that were used to describe the global NSD process. An exploratory correlation analysis indicated that there was substantial intercorrelation among the variables. Thus, factor analyses (principal component, Varimax rotation) and reliability analyses (Cronbach Alpha) were conducted, in order to reduce the 46 variables to a more manageable set of composite dimensions. The initial results were evaluated using several tools: examination of factor loadings, Cronbach Alpha coefficients, scree test, and factor interpretability. This led to a second run, this time asking for nine-factor solution, which suggested that three of the 46 variables—which did not load substantially on any of the factors—be eliminated. The decision to remove the three variables did not appear to compromise the outcome, as they were peripheral to the key NSD process issues. Moreover, the decision was supported by improved Cronbach Alpha values. Thus, a final set of 43 variables was used. These loaded on a total of nine factors (at Eigenvalue ≥ 1), which explained 69.55% of the variation in the data set.

Although the nine factors extracted in the above analyses were consistently found in every run of the factor analysis, there were some difficulties in factor interpretation. Careful scrutiny of the 43 variables indicated that there appeared to be two broad groupings of variables. The first grouping tended to encompass variables that were relatively straightforward in that they described “what” the NSD process involved; for example, did the company have a formal process in place, or did the company use gatekeepers etc. The second group comprised variables that were of a more qualitative nature, concerned with “how” the NSD process is typically carried out by firms. This

result is also in accordance with Cooper's (1998, p.35) suggestion that simply having a process in place does not suffice, but "rather, it is the quality (i.e., "how" the NSD process is carried out) and nature (i.e., "what" the NSD process is made up of) of the process that really drives performance". Consequently, two separate factor analyses were carried out. The "what" model, which consisted of 27 variables, loaded on six factors accounting for 70.18% of total variation (at Eigenvalue ≥ 1). The "how" model, which included 16 variables, loaded on five factors explaining 71.26% of total variation (at Eigenvalue ≥ 1).

Cronbach alpha (α) for five of six factors in the "what" model ranged from 0.730 to 0.886, which are acceptable reliability coefficients when using as a criterion that $\alpha \geq 0.7$ is the minimal acceptable value for exploratory research (Whitley, 1996). One factor had a Cronbach alpha coefficient of 0.625, which is a bit lower than the 0.7 cut-off level; nevertheless, this dimension appears to be quite meaningful in the context of this study and is in line with Nunnally's (1978) $\alpha \geq 0.5$ level, when conducting exploratory research.

For the "how" model, Cronbach alpha for four of the five factors ranged from 0.700 to 0.864, which are acceptable reliability coefficients. Only one factor in this model had a Cronbach alpha with a lower value (0.545). Although this is a value somewhat lower than the rest, this is an acceptable value when conducting exploratory research (Nunnally, 1978), and the results indicate that the two variables loading on that factor are reasonably consistent and meaningful. Thus, the factor was included in all subsequent analyses.

The factors derived from the principal component analyses are analogous to constructs identified in the literature. The factors comprising the “what” model include (see table 4): (1) *Detailed Formal NSD Process in Place* (Easingwood, 1986; de Brentani, 1989, 1991, 1993; Cooper and Kleinschmidt, 1991, 1995; Terrill, 1992; Martin and Horne, 1993; Edgett, 1994; Griffin, 1997), (2) *Up-Front Homework* (Cooper and de Brentani, 1991; Edgett, 1996; Cooper and Edgett, 1999), (3) *Planned Global Launch* (Nicoulaud, 1980; de Brentani, 1991; Easingwood and Arnott, 1991; Urban and Hauser, 1993; de Brentani and Ragot, 1996; Terrill and Middlebrooks, 1996; Tax and Brown, 1998), (4) *“Glocal” Input* (Nicoulaud, 1980; Devinney, 1995; Cooper, 1998, 1999), (5) *Customer Input* (Cooper and de Brentani, 1991; Griffin and Hauser, 1993; Cooper, Easingwood, Edgett, Kleinschmidt and Storey, 1994), and (6) *Clear Global Strategy* (Scheuing and Johnson, 1989; Terrill, 1992; Terrill and Middlebrooks, 1996; Cooper and Edgett, 1999). The “how” model incorporates the following five factors (see table 5): (1) *NSD Culture and Knowledge-Sharing Worldwide* (Nakata and Sivakumar, 1996; Souder and Jenssen, 1999), (2) *Team Involvement Worldwide* (Nakata and Sivakumar, 1996; McDonough, Kahn and Barczak, 2001), (3) *Cross-Functional Team plus Strong Leadership* (Denison, Hart and Kahn, 1996; Bishop, 1999; Bailey, 2000; Moenart, Caeldries, Lievens, and Wauters, 2000), (4) *Internal Communication and Effective Use of Information Technology (IT)* (Erramilli, 1990, 1992; McDermott, Kang and Walsh, 2001), and (5) *IT Part of New Service* (Dahringer, 1991; Knight, 1999; McDermott, Kang and Walsh, 2001). Each of these factors is described in greater detail in the following pages.

2.1 Description and Definition of Constructs: The “What” Model

The “what” model describes what the NSD process is made up of. It comprises six straightforward factors that explain what is in place in a NSD process. The six factors include: a *Detailed and Formal NSD Process in Place (W1)*, *Up-Front Homework (W2)*, *Planned Global Launch (W3)*, *“Glocal” Input (W4)*, *Customer/Partner Input (W5)*, and *Clear Global Strategy (W6)*. Each of these factors is described below.

W1: Detailed Formal NSD Process in Place

NSD programs that rated high on this construct use a *Detailed Formal NSD Process*, which includes a standardized set of stages that guide the development of new services from idea to launch. These companies are organizations whose international NSD process has clearly defined GO/NO GO decision points for each stage of the process, as well as gatekeepers that make decisions regarding the progression of projects. Moreover, firms rating high on this construct have a global NSD process in place that clearly describes specific activities for each stage of the process. Finally, regardless of a new service’s level of innovativeness, these companies claim to actually use a formal NSD process for most of their projects.

Having a detailed formal NSD process in place is also supported in the literature. Previous research has determined that companies that take a formal approach towards NSD are more likely to be successful (de Brentani, 1991, 1993; Martin and Horne, 1993; Edgett, 1994). Moreover, several NSD process models (Cowell, 1984; Bowers, 1989; Scheuing and Johnson, 1989; Terrill and Middlebrooks, 1996) that include detailed stages and activities have been introduced to assist companies in their NSD efforts. Also,

Cooper (1993, 1998, 1999) advocates that when a company undertakes a new development effort, it should implement a process that has clearly defined stages and evaluation points.

W2: Up-Front Homework

The second construct, *Up-Front Homework*, encompasses six variables. It describes activities that should be carried out prior to designing any new service. Among these activities is the concept of developing complete project definitions such as identifying target markets and service features, and conducting thorough market studies to determine features and requirements of the service. Firms whose NSD program loaded high on this factor conduct early project assessments and analyses, focus on developing unique or greatly improved customer benefits, and test market acceptance of their new service ideas prior to undertaking design. In addition, during the design stage, these firms typically carry out some form of “blueprinting” (or service mapping) of planned international services, for example by analyzing service elements, potential fail points, and alternate service delivery processes.

This is another dimension that is clearly supported in the literature. Cooper and de Brentani (1991) recommend that when a company undertakes a new project it should study the market, customers, and competitors as well as carry out a financial analysis. Edgett (1996) determined that projects where firms conduct up-front homework have a better likelihood of introducing a successful service from (82% versus 39%). Knight (1999) states that extensive market research is necessary for the successful launch of international service offerings. Several advantages can be derived from taking the time to

do up-front homework: increased chances for success, reduced time to market due to accurately defined projects and, thus, fewer errors in the development process, and earlier anticipation of any problems, before they become too expensive or too difficult to fix (Cooper and Edgett, 1999). In essence, the quality of homework that has been conducted prior to developing a new service will distinguish between successful and unsuccessful projects (Cooper and de Brentani, 1991).

W3: Planned Global Launch

Planned Global Launch, the third construct, is comprised of five variables. It refers to the course of action taken by firms to commercialize their new service. NSD programs of firms loading high on this factor placed great importance on the introduction phase of their global new services. For these firms, launching an international new service consists of a highly detailed and formal launch plan that is based on strong market information. Furthermore, results showed that focusing on frontline personnel is essential. Companies strong on this construct train their frontline personnel with regard to the knowledge and skills necessary for delivering new services and they also actively promote their new services to frontline personnel in all areas. Training even consisted of empowering personnel to “recover” potential service failures, when deemed necessary.

Literature claims that expenditures on commercialization can be substantial, representing over half of sales revenue during the first year (Urban and Hauser, 1993). This may explain why “quality of execution of the launch” is considered to be the third most important factor in the development of new services (de Brentani, 1989, 1991; Cooper and de Brentani, 1991). Companies whose NSD process includes a detailed, well

thought-out launch have been found to have a greater chance of attaining success (de Brentani, 1991; Edgett, 1996). In addition, great emphasis should be placed on the selection and training of frontline personnel (Parasuraman, Berry and Zeithaml, 1991; Easingwood and Arnott, 1991), given the variability aspect in service production (de Brentani, 1989; de Brentani and Ragot, 1996). This is particularly important in the successful delivery of international new services, where firms must ensure that the personnel who interact with clients are competent not only in delivering the new service but also in relaying and protecting the right corporate image (Nicoulaud, 1980; Dahringer, 1991). Therefore, practicing internal marketing—that is, marketing the new service to service employees within the firm—can be expected to enhance their performance (Berry, 1995; Easingwood and Arnott, 1991; Terrill and Middlebrooks, 1996). Lastly, past research strongly recommends that firms develop and implement formal guidelines to empower their frontline personnel to identify and recover service failures (Terrill and Middlebrooks, 1996; Tax and Brown, 1998).

W4: “Glocal” Input

The next dimension of “what” the global NSD process is composed of is called “*Glocal*” *Input* and it encompasses five variables. It describes the approach used to gather input from worldwide locations (i.e., during the earlier or later stages of the process). This dimension also describes how effective the NSD process is in facilitating the incorporation and coordination of internationally dispersed information and activities. Finally, firms strong on this construct have a NSD program that uses a centralized approach to formulating a worldwide strategy.

When a company wants to extend its business globally, Tai and Wong (1998) recommend a “Glocal” approach, which implies thinking globally, but developing and implementing new projects locally. Also, Devinney (1995) recommends that in developing new international services, companies should consider using a more centralized approach while still bearing in mind differences in markets. Thus, in order to fully understand the needs of potential customers, international service marketers are required to gather information and carefully study prospects in foreign markets (Nicoulaud, 1980).

W5: Customer/Partner Input

The next group of variables identified in the “what” analysis, called *Customer/Partner Input*, describes the involvement from external sources such as customers and other associates. Programs that rated high on this construct have a NSD process in place that incorporates customer and/or partner input during all stages and that is well understood by all individuals involved with the NSD effort. These companies also tend to link with local partners when launching their international new services.

Given that services are simultaneously produced and consumed, past research advocates that a vital criterion in achieving successful service performance is developing services based on the voice of the customer (Cooper and de Brentani 1991; Griffin and Hauser, 1993; Cooper, Easingwood, Edgett, Kleinschmidt and Storey, 1994). The dynamism and varying needs of markets requires that organizations stay closer to both their customers and partners in order to understand their changing needs and preferences (Gehani, 1992; Terrill and Middlebrooks, 1996). Moreover, in business-to-business

services, the customer is likely to be just as knowledgeable about the company's needs and how they should be taken care of, which makes the need to include the customer's input even more obvious for the organization supplying the service (Von Hippel, 1978; de Brentani and Ragot, 1996). Essentially, an organization will achieve the delivery of a successful new service if it incorporates customers' inputs in every step of the NPD process (Cooper and Edgett, 1999).

W6: Clear Global Strategy

The final set of variables in the "what" model describes the strategy used in developing a new service targeted towards the international market (i.e., *Clear Global Strategy*). Companies that rated high on this construct have a clear set of strategic goals which NSD programs for international markets are expected to meet. These firms also have worldwide product innovation charters in place, which clearly specify the objectives, responsibilities and expected contributions of all NSD subunits. Finally, their NSD programs use a planning process that requires active involvement from all groups taking part in the NSD worldwide.

Past research supports the notion of approaching a NSD process by having a clear strategy that is based on the company's overall corporate objectives to guide the NSD team throughout the project (Scheuing and Johnson, 1989; Terrill and Middlebrooks, 1996). Strategic planning involves associating the NSD with the organization's corporate strategy and goals, identifying areas of focus for service development, and making sure that the innovation strategy is communicated throughout the firm (Cooper and Edgett, 1999). This requires that the firm specify in its new service strategy the objectives of the

project in terms of target market, positioning, and expected financial returns (Lovelock, 2001). Thus, when a company wants to introduce a new international service, developing NPD strategies that embody goals and resources at the global level is most important (Devinney, 1995; Gilmont, 1995; Chiesa, 2000).

Table 4: NSD Process Descriptive Factors – The “What” Model: Results of Factor and Reliability Analyses

Factor name	Variables loading on factor	Factor loading
W1: Detailed Formal NSD Process in Place $\alpha = 0.8856$	Global NSD process has clearly defined GO/No GO decision points Global NSD has gatekeepers Use of formal NSD Process-standardized stages Global NSD process defines specific activities for each stage NSD process is actually used for most projects	0.865 0.859 0.734 0.665 0.492
W2: Up-Front Homework $\alpha = 0.8767$	Before designing service complete project definitions are developed Before designing service thorough studies of markets are carried out Before designing service early project assessment & analysis is conducted During design stage details of international service are carefully mapped out Before designing service firm tests market acceptance Before designing service focus on unique or greatly improved customer benefits	0.810 0.808 0.710 0.584 0.537 0.485
W3: Planned Global Launch $\alpha = 0.8762$	When launching global new service we train frontline personnel-knowledge, skills When launching global new service we actively promote new service to frontline When launching global new service we empower frontline to recover failures When launching global new service we develop a detailed & formal launch When launching global new service we base the plan on solid market information	0.862 0.746 0.705 0.576 0.560
W4: “Glocal” Input $\alpha = 0.8485$	Gathering input is coordinated during the early stages of the process Gathering input is coordinated during the later stages of the process NSD process effective in facilitating incorporation of internationally dispersed info NSD program uses a centralized approach to formulate worldwide strategy NSD process effective in facilitating coordination of internationally dispersed activities	0.765 0.629 0.615 0.605 0.588
W5: Customer/ Partner Input $\alpha = 0.6250$	NSD process incorporates customer input during all stages Linking with local partner units NSD process is well understood all people involved with NSD	0.713 0.536 0.507
W6: Clear Global Strategy $\alpha = 0.7300$	Firm has worldwide innovation charter specifying objectives and responsibilities Company has clear set of strategic goals NSD program has planning process that has active involvement from groups globally	0.720 0.623 0.551

2.2 Description and Definition of Constructs: The “How” Model

The “how” model describes how the NSD process is typically carried out by firms. The descriptive factors of this model are of a more qualitative nature and include the following five factors: *NSD Culture and Knowledge Sharing Worldwide (H1)*, *Team Involvement Worldwide (H2)*, *Cross-Functional Team plus Strong Leadership (H3)*, *Internal Communication and Uses of IT (H4)*, and *IT as Part of the New Service (H5)*. Each of these factors is described below.

H1: NSD Culture and Knowledge Sharing Worldwide

The first construct of the “how” model, which comprises five variables, relates to the broad NSD culture within the total organization and the type of methods used by the firm to more effectively share information within the company, worldwide. Programs that rated high on this construct stress the importance of sharing knowledge across different geographical subunits and strongly encourage contributions from NSD team members located in different countries. In order to promote an innovative corporate culture for their international NSD program, these managements actively encourage their employees, worldwide, to submit new service ideas while at the same time emphasizing responsiveness to differences in local markets. Furthermore, to enhance communication among the geographically dispersed sources of NSD knowledge, these firms have established mechanisms such as e-mail, meetings, travel, and internal conferences.

A study conducted by Edgett and Parkinson (1994) concluded that the second most important factor in delivering a successful new service is the organizational factor. When a company wishes to expand globally, however, it may experience challenges in

communicating across functional and cultural lines (Chiesa, 1996, 2000; Moenart, Caeldries, Lievens and Wauters, 2000). Nakata and Sivakumar (1996) believe that, in order to effectively communicate within the organization at the global level, it is necessary that the process used to develop a new service accounts for differences between cultures. Given that some cultures may perform better than others in certain phases of the NSD process, Nakata and Sivakumar (1996) recommend that the organization share knowledge by selecting countries that are more likely to perform better in the first stages of the process in conjunction with countries that are predisposed to performing better in the later phases of the NSD process. Moreover, they explain that companies can derive greater opportunities by taking into consideration differences in cultures and encouraging employees located in different countries to submit new ideas. However, companies must bear in mind that, even though some core NPD management principles may be applied to all cultures, others require adjustment for cultural variations (Souder and Jenssen, 1999). Finally, to facilitate the communication between the geographically dispersed sources of NSD knowledge necessitates that companies set up mechanisms such as e-mail, travel, and videoconferences (Knight, 1999).

H2: Team Involvement Worldwide

The second construct, *Team Involvement Worldwide*, focuses on the specific members that make up the NSD team. This factor comprises three variables and describes the level and effectiveness of collaboration among geographically dispersed team members in developing international new services. When organizing global NSD project teams, companies rating high on this factor ensure that teams are truly global by

including members from different countries and regions. They also make certain to provide opportunities for face-to-face contact among geographically dispersed members of the NSD project teams. Finally, these organizations typically ensure that frontline personnel from different locations worldwide play an active role as part of the NSD team.

Given the differences in cultures, Nakata and Sivakumar (1996) recommend that in developing new services, teams should consist of members from different countries in order to capitalize on the strengths of each culture. According to McDonough, Kahn and Barczak (2001), one out of every five NPD teams comprise members who are not only from different cultural backgrounds but also from different countries. Direct contact between team members is encouraged because the level of team performance is dependent on the interaction between the team members (Sniezek and Henry, 1989). In addition, research in the domestic market supports the notion of incorporating frontline personnel in the development process in order to introduce a service that meets customer needs (Easingwood, 1986; de Brentani, 1993), and consequently, this is expected to also apply at the global level.

H3: Cross-Functional Team Plus Strong Leadership

Cross-Functional Team and Strong Leadership, the third construct of the “how” model, refers to the functional nature of teams and the extent of involvement by the leaders. Four variables loaded on this factor. International NSD programs rating high on this factor, have leaders that take full responsibility and that are accountable for driving projects through the entire NSD process. Moreover, their teams are of a multi-disciplinary nature (consisting of members from different functions such as finance,

marketing, R&D, and operations), and there is excellent cross-functional cooperation among team members.

Cooper's second-generation model proposes for NPD teams to be cross-functional, by including members from different departments, in order to decrease organizational roadblocks. Success is dependent on effective and efficient communication in international new product development teams (Moenart, Vaeldries, Lievens, and Wauters, 2000). Cross-functional teams allow team members to work together in recognizing and solving problems efficiently, by coordinating resources and ideas (Bishop, 1999). As a result of this cooperation between members, companies can expect their employees to decrease their work time, increase their learning, and improve innovation (Denison, Hart and Kahn, 1996). However, it is also important that the leader within the team is both committed to the project and has effective leadership skills (Bailey, 2000). Moreover, even though companies have been known to change leaders throughout the course of their projects, this is not a recommended approach (Nakata and Sivakumar, 1996).

H4: Internal Communication and Uses of IT

The next factor, *Internal Communication and Uses of Information Technology (IT)*, describes the extent to which IT is used to enhance communication within the firm. Two variables loaded on this factor. Companies who ranked high on this factor tend to transfer their NSD-related information within their international organization by using information and communication technology (e.g. e-mail, Internet, LAN, and conference

calls). In addition, for these firms IT plays a vital role in the internationalization of their new service development programs.

Advancements in communication and information technology have contributed substantially to the trend of companies expanding their services operations on a global scale. This progression in technology has facilitated the internationalization of services since the requirement of a physical presence is less necessary (Erramilli, 1990, 1992). In addition, these advancements allow corporations to communicate quickly and effectively within the organization (McDermott, Kang and Walsh, 2001) by using means such as e-mail and the Intranet, and they also allow for a more effective and efficient transfer and analysis of information within the firm (Knight, 1999).

H5: IT part of New Service

The last construct of the “how” model, *IT part of New Service*, consists of two variables and explains the degree to which advances in IT plays a role as an integral part of the new service itself. NSD programs rating high on this factor use improvements in communication and information technology (CIT) to achieve mass customization of services destined for international markets. Also, the IT-based character of these new service programs substantially reduces barriers (such as geographical distance) to accessing foreign markets.

The explosion in CIT enables companies to function and compete worldwide (Knight, 1999). Advances in information technology, which allow for immediate and direct transfer of information at the individual level, have made customization at the international level possible (McDermott, Kang and Walsh, 2001). Moreover, in order to

successfully introduce services to international markets, making use of technology advances to assist the design and delivery of the new service can prove to be very helpful (Dahringer, 1991).

Table 5: NSD Process Descriptive Factors – The “How” Model: Results of Factor and Reliability Analyses

Factor name	Variables loading on factor	Factor loading
H1: NSD Culture + Knowledge Sharing Worldwide $\alpha = 0.8639$	Firm emphasizes knowledge sharing across different geographical subunits Firm encourages contributions from NSD team members in different countries Firm emphasizes responsiveness to differences in local markets Mngmt actively encourages employees worldwide to submit new service ideas Firm has established mechanisms to enhance communication between geographically dispersed sources	0.902 0.896 0.781 0.576 0.556
H2: Team Involvement Worldwide $\alpha = 0.8567$	Teams are truly global i.e. include members from different countries & regions There are opportunities for face-to-face contact among geo-dispersed members Teams actively involve frontline personnel from different locations worldwide	0.846 0.814 0.813
H3: Cross-Functional Team + Strong Leadership $\alpha = 0.7445$	Leaders are responsible for carrying projects through entire NSD process Teams are multi-disciplinary There is cross-functional cooperation among team members There is an accountable leader for driving the project	0.783 0.759 0.698 0.693
H4: Internal Communication Uses of IT $\alpha = 0.6998$	Transfer NSD-related information within firm by using communication & IT IT plays a key role in internationalizing new service	0.772 0.722
H5: IT part of New Service $\alpha = 0.5454$	Advances in IT help to reduce barriers to accessing foreign market Advances in IT permit mass customization of service for global markets	0.822 0.774

3 Relational Analysis

The second aspect of the analysis, called relational analysis, attempts to establish links between the factors that describe the global NSD process with the performance of global NSD programs of firms. The relational analysis was done in three ways: Pearson correlation, regression, and winner vs. less successful t-test analyses. A bivariate Pearson correlation analysis was carried out in order to obtain a preliminary indication about which of the factors from both the “what” and “how” models appeared to be linked to the performance of global NSD programs. Regression analyses were then conducted to determine whether there was a directional relationship (i.e., NSD process factors leading to outcomes) and what is the importance of each of the descriptive NSD process factors in explaining the performance outcomes. Next, the sample was split into two groups to look at possible differences between very successful and substantially less successful international NSD programs. This final analysis, which compares the more extreme cases in terms of NSD performance, was done in order to gain better insights about which factors lead to positive outcomes in global NSD programs. For the three relational analyses, simple results will be presented for the correlation and regression analyses, while a more in-depth presentation and discussion together with anecdotal evidence will be provided for the third, t-test, analysis.

3.1 Performance Measures

Given the notion that business, and specifically NPD performance should not be assessed with only one criterion (Griffin and Page, 1996), several performance measures were used to evaluate the success of the global NSD programs under study. The specific performance measures used to conduct this evaluation include: “Success Rate”, “Sales Impact”, “Spending on Budget”, “Profit Returns”, and “Window of Opportunity”. Following is a brief description of each of these measures, as described by de Brentani and Kleinschmidt (2000, 2001, 2002).

“Success Rate” relates to the percentage of new services introduced that are considered a “success” by the firm, whatever that may mean to the organization. This was measured by asking participants to think about the program of international new service projects over the last three years, and to provide the percentage with regard to success rate (i.e., what percentage are considered successes by the firms). Some companies have a high “Success Rate”, meaning that a high percentage of their NSD projects meet their minimum objectives. For example, hiring expert employees, and training frontline personnel can have a favorable impact on “Success Rate”. This performance measure usually includes all new services that were actually launched and maintained as part of the company’s portfolio. However, this performance measure cannot be used as the only measure. For example, even though projects may be in line with corporate objectives, they may only be “small” successes because they simply reached the minimum requirements. Therefore using “Success Rate” as a sole criterion to assess performance is not recommended.

“Sales Impact” measures the effect of the international new service program on the firm’s total sales. Respondents were asked to rate their global/international NSD program on the company’s sales over a three-year period (where 1= strong negative impact and 7= strong positive impact). “Sales Impact” incorporates components such as market share and sales revenue. Several items seem to lead to a high “Sales Impact”. When a firm is proficient in new service development (i.e., implements a detailed formal NSD process and effectively manages the NSD team) and ascertains that the new service fits with market characteristics, it increases its chances of achieving high sales performance (de Brentani, 1989, 1991). When companies introduce services in high growth markets, they increase their chances of attaining success on this dimension (de Brentani, 1989). In addition, a high “Sales Impact” can be achieved by concentrating on new services with which the firm is familiar and for which it has a reputable name in the market. Reaching high “Sales Impact” may be described by a high sales volume, an above average market growth and a strong market share (de Brentani, 1989, 1991). This performance measure, however, differs from “Success Rate”, in that the latter considers a program to be successful usually if it meets objectives that are above the minimum criteria.

The third performance measure, “Spending on Budget”, evaluates to what degree the new services of the international NSD program were developed on budget (where 1=substantially exceeded budget and 7= all were on budget). Although this is yet another financial indicator, this performance measure is different from the others in that it does not evaluate how the new service is performing once it is launched to business-to-business customers. Rather, it evaluates to what degree the new services comprising the

international NSD program were developed on budget even before the launch. In order to spend within budget, companies must implement and effectively manage a formal NSD process (de Brentani, 1991). Also, when companies develop new services that have a good fit with their core competencies and resources, NSD costs are more likely to be in line with expectations (e.g. fewer errors or unexpected events). This is an important performance measure because it allows for speed and efficiency in new service development (which may lead the firm to being the first to market the new service) and simultaneously decreases unnecessary waste in time, human and financial resources.

The next performance measure, namely “Profit Returns”, assesses how profitable the international/global NSD program of the firm was relative to spending (where 1=very poor, negative returns and 7= excellent returns). This implies that companies that experience high sales revenue and are very efficient at minimizing costs at all levels of NSD through the reduction of errors, a well-implemented process, and gaining economies of scale, will ultimately generate greater profits. This indicator is used as an NSD success measure because, in the end, every firm seeks to generate profits. Moreover, this is an important financial criterion, because a company may have a high “Success Rate” (i.e., projects meet minimum objectives), but few projects may actually achieve a high profitability. Highest returns with new developments are typically the result of very unique and proactive —often somewhat riskier—“newer” type of products, because of being first to enter the market (Urban and Hauser, 1993).

The last performance measure, “Window of Opportunity”, assesses performance in terms of how successful the international/global NSD program was in opening new markets for the firm (where 1=not at all and 7= great success, many opportunities).

Companies who seek windows of opportunity often have longer-term strategic objectives, such as moving into different directions (e.g., “getting feet wet” in new markets). However, this does not necessarily lead to high profits or sales. This criterion was used as a NSD success measure because it assessed a non-financial aspect of the program performance.

One must keep in mind, however, that these performance measures come from much broader studies of what leads to NPD success and not just the NSD process literature. As such, it is likely that not all NSD process factors will have an impact on them. Moreover, because the NSD process is only one of several factors that has been shown to impact performance (Easingwood, 1986; de Brentani, 1989,1991,1995; Cooper and de Brentani, 1991; Edgett, 1994), we cannot expect that its relative importance will be overwhelming. Following is a description of the results obtained from the relational analysis for both the “what” and “how” models.

3.2 Correlation of Global NSD Factors with Performance Measures

A bivariate Pearson correlation analysis relating the “what” and “how” factors to the five performance measures was carried out in order to obtain a preliminary indication about which of the factors are linked to the performance of international NSD programs (see table 6). The results clearly indicate some significant, and potentially important, links between certain descriptive NSD process factors and the performance variables. In the “what” model, significant correlations exist between all of the descriptive NSD process factors and one or more of the performance variables. In particular, “*Glocal*” *Input (W4)* appears to play an extensive role, given its significant (α ranges from 0.01 to

0.10) correlation with four of the five performance measures. Also, *Up-Front Homework (W2)* seems to be important as indicated by its significant correlation with three of the five performance measures. On the other hand, in the “how” model, significant correlations exist only between the first two NSD process factors and the performance measures. In this model, *NSD Culture and Knowledge Sharing Worldwide (H1)* and *Team Involvement Worldwide (H2)* are potential contributors to four and three of the outcome measures, respectively.

Looked at in another way, the results of the correlation analysis give some insight about what NSD process factors require emphasis for achieving different performance objectives. In the “what” model, for example, if achieving a high “Sales Impact” is the objective, then at least four NSD process factors play a role, that is: “*Glocal*” *Input (W4)* ($\alpha \leq 0.01$), *Customer/Partner Input (W5)* ($\alpha \leq 0.10$), *Planned Global Launch (W3)* ($\alpha \leq 0.10$), and *Detailed Formal NSD Process in Place (W1)* ($\alpha \leq 0.10$). If achieving a “Window of Opportunity” is the objective then this requires emphasis on at least three of the “what” NSD process factors: *Clear Global Strategy (W6)* ($\alpha \leq 0.05$), “*Glocal*” *Input (W4)* ($\alpha \leq 0.01$) and *Up-Front Homework (W2)* ($\alpha \leq 0.01$). In contrast, the other three performance objectives appear to require a more focused approach in that only two of the five “what” factors are significant correlates. Similarly, in the “how” model, depending on the performance objective, different NSD process factors are relevant. For a high “Success Rate” and “Sales Impact”, only *Team Involvement Worldwide (H2)* is a significant “how” NSD process factor. Also, for “Window of Opportunity”, only *NSD Culture and Knowledge Sharing Worldwide (H1)* seems to play a role. On the other hand, achieving “Spending on Budget” and “Profit Returns” seem to require a broader

focus; that is, emphasis on both *NSD Culture and Knowledge Sharing Worldwide (H1)* and *Team Involvement Worldwide (H2)*.

Although this correlation analysis, as presented in table 6, does offer some preliminary insights about potential relationships between the “what” and “how” NSD process factors and different performance objectives, the results do not provide information about the direction of the relationship. Therefore, this leads to the next step of the analysis, which consists of undertaking a regression analysis in order to provide insight as to the direction of the relationship.

Table 6: Results of Correlation Analysis: Descriptive NSD Process Factors with Performance Variables

WHAT model		Success Rate	Sales Impact	Spending Budget	Profit Returns	Window of opportunity
W1: Detailed Formal NSD Process in Place	Pearson Sig (p)	0.100 0.394	0.186* 0.100	0.022 0.845	0.244** 0.032	0.151 0.184
W2: Up-Front Homework	Pearson Sig (p)	0.192* 0.098	0.081 0.479	0.192* 0.090	0.083 0.474	0.258** 0.022
W3: Planned Global Launch	Pearson Sig (p)	0.003 0.979	0.200* 0.079	0.162 0.153	0.096 0.407	-0.012 0.915
W4: “Glocal” Input	Pearson Sig (p)	0.199* 0.087	0.315*** 0.005	0.083 0.469	0.328*** 0.004	0.259** 0.021
W5: Customer/Partner Input	Pearson Sig (p)	0.087 0.459	0.216* 0.058	0.182* 0.100	0.153 0.183	0.178 0.117
W6: Clear Global Strategy	Pearson Sig (p)	0.173 0.137	0.027 0.817	0.152 0.182	-0.072 0.533	0.270** 0.016
HOW model						
H1: NSD Culture+ Knowledge Sharing ww	Pearson Sig (p)	0.032 0.784	0.121 0.277	0.308*** 0.005	0.259** 0.019	0.235** 0.034
H2: Team Involvement worldwide	Pearson Sig (p)	0.249** 0.029	0.249** 0.023	0.193* 0.081	0.200* 0.072	0.130 0.246
H3: Cross-Functional Team + Strong Leadership	Pearson Sig (p)	0.172 0.134	0.149 0.178	0.165 0.136	0.164 0.140	0.084 0.452
H4: Internal Communication and Uses of IT	Pearson Sig (p)	0.145 0.207	0.034 0.763	-0.045 0.685	-0.029 0.793	-0.054 0.629
H5: IT part of new service	Pearson Sig (p)	-0.033 0.775	0.021 0.850	0.006 0.956	0.061 0.586	0.083 0.459

*** Correlation is significant at the 0.01 level (2-tailed)

** Correlation is significant at the 0.05 level (2-tailed)

* Correlation is significant at the 0.10 level (2-tailed)

3.3 Regression Analysis

The next phase of the analysis consisted of carrying out a set of stepwise regressions for each of the “what” and “how” models, in order to determine what is the importance of each of the descriptive NSD process factors (i.e., the independent variables) in explaining the outcomes or performance measures (i.e., the dependent variables). A regression permits one to assess how much of the total variation in the dependent variable is accounted by each of the (and all together) independent variables in the equation (Norusis 1988). In total, ten regression equations were carried out—one for each performance measure—with six and five factors comprising the “what” and “how” models as independent variables, respectively. The cut-off criterion for the entry of the factors was set at $p \leq 0.10$. Results of the regressions substantially corroborate the findings from the correlation analysis. In other words, some of the NSD process factors play a fundamental role in the performance measure variance. Tables 7 and 8 depict the results from these regressions. Although the values for the equations of the adjusted R^2 are relatively low, they are nevertheless, highly significant (p ranges from 0.001 to 0.10). To appreciate the results, it is important to keep in mind that this study is part of a much broader study and that the NSD process factors studied here comprise only one of several important dimensions that can be expected to impact NSD performance for global markets (de Brentani and Kleinschmidt, 2000, 2002).

3.3.1 Results of Regression Analysis: The “What” Model

Three of the five performance equations in the “what” scenario—i.e., “Window of Opportunity”, “Sales Impact” and “Profit Returns”—have relatively high R^2 ,

significant at the 0.001 level, while the “Success Rate” and “Spending on Budget” equations are significant at the 0.05 and 0.10 levels, respectively. The five performance models are described below in the order of their Adjusted R^2 s (see table 7 for details).

The adjusted R^2 for the “what” model relating to “Window of Opportunity” (i.e., the extent to which the new service opened up new market opportunities in the global arena for the firm) is 0.200, which means that 20% of the total variation in this performance dimension is explained by the descriptive NSD process factors. In particular, *Up-Front Homework (W2)*, *“Glocal” Input (W4)*, and *Clear Global Strategy (W6)* were found to have a significant impact ($p \leq 0.01$), while *Customer/Partner Input* is also shown to have some effect ($p \leq 0.10$).

Next in terms of the extent to which the “what” factors account for performance variation is “Sales Impact” (i.e., the impact of the global new service program on the firm’s sales, over a three year period). According to the regression results, achieving a strong “Sales Impact” appears to be the result of excellent *“Glocal” Input (W4)* ($p \leq 0.01$), *Customer/Partner Input (W5)* ($p \leq 0.05$), a *Planned Global Launch (W3)* ($p \leq 0.05$), and ensuring as part of the Global NSD process a *Detailed Formal Launch (W1)* ($p \leq 0.10$). The adjusted R^2 for the “what” model relating to “Sales Impact” is 0.182, which implies that 18.2% of the total variation in this performance outcome can be explained by these NSD process factors.

Next in terms of percent of performance variation explained is “Profit Returns” (i.e., effect of new service program on company’s profits over a three year period). Here, *“Glocal” Input (W4)* ($p \leq 0.01$) and *Detailed Formal Launch (W1)* ($p \leq 0.10$) account for almost 15% of the explained variation. In the “Success Rate” equation (i.e., percentage

of projects that were developed and regarded as commercial successes), 5.4 percent of the variation was explained here, by *Up-Front Homework (W2)* and “*Glocal*” *Input (W4)*, both at the 0.10 level. Finally, in the equation for “Spending on Budget” (i.e., the extent to which the new services of the firm’s international NSD program were developed on budget) only 2.4% of the total variation can be accounted by the NSD process “what” variable; that is, by *Up-Front Homework (W2)* ($p \leq 0.10$).

Table 7: Results of Multiple Regression Analysis – The “What” Model

<i>What Model</i>	Performance Measures				
Factors	Success Rate	Sales Impact	Spending on Budget	Profit Returns	Window of Opportunity
W1: Formal NSD Process In Place	–	0.275+	–	0.388+	–
W2: Up-Front Homework	5.757+	–	0.291+	–	0.391**
W3: Planned Global Launch	–	0.305*	–	–	–
W4: “Glocal” Input	6.089+	0.474**	–	0.530**	0.397**
W5: Customer/Partner Input	–	0.311*	–	–	0.267+
W6: Clear Global Strategy	–	–	–	–	0.396**
Intercept	55.544	4.822	4.174	4.311	4.946
R ²	0.080	0.224	0.037	0.170	0.241
Adjusted R ²	0.054	0.182	0.024	0.148	0.200
F of Relationship	3.119	5.273	2.945	7.604	5.864
Significance of Model	0.050	0.001	0.090	0.001	0.000

Note: The following symbols represent levels of significance

** = 0.01

* = 0.05

+ = 0.10

– = Not Significant

3.3.2 Results of Regression Analysis: The “How” Model

Five performance-related regression equations were developed for the “how” situation. Of these, only two equations —“Spending on Budget” and “Profit Returns”— had R^2 values significant at the 0.01 level, with the three other equations being significant at the 0.05 level (see table 8 for details). As already indicated by the results of the correlation analysis (see table 6), only two of the five “how” NSD process factors appear to play a significant role in achieving Global NSD performance. The results are discussed below.

The adjusted R^2 for the “how” model relating to “Spending on Budget” (i.e., the extent to which the new services of the firm’s international NSD program were developed on budget) was the strongest of the five equations (Adj. R^2 =0.113). In other words, 11.3% of the total variation in this dependent variable can be explained by the independent variables. To this end, two “how” NSD process factors —i.e., *NSD Culture and Knowledge Sharing Worldwide (H1)* (at $p \leq 0.01$) and *Team Involvement Worldwide (F2)* (at $p \leq 0.10$)— were found to have a significant impact.

In the “Profit Returns” equation (i.e., effect of new service program on company’s profits over a three year period) 8.8% of the variation can be accounted for by the same two “how” factors: first, by *NSD Culture and Knowledge Sharing Worldwide (H1)* ($p \leq 0.05$) and, secondarily, by *Team Involvement Worldwide (H2)* ($p \leq 0.1$ level).

In the other three performance equations, only one of the “how” factors plays a significant explanatory role. Specifically, *Team Involvement Worldwide (H2)* ($p \leq 0.05$) was the only variable that accounted for 5.1% and 4.9%, respectively, of the total variation of “Sales Impact” (i.e., the impact of the new service program on the firm’s

sales over a three year period) and in “Success Rate” (i.e., percentage of projects that were developed and regarded as commercial successes). Finally, in the equation for “Window of Opportunity” (i.e., the extent to which the new service opened up new market opportunities for the firm) only 4.3% of the total variation of the dependent variable was accounted by *NSD Culture and Knowledge Sharing Worldwide (H1)* ($p \leq 0.05$).

Table 8: Results of Multiple Regression Analysis – The “How” Model

<i>How Model</i>	Performance Measures				
Factors	Success Rate	Sales Impact	Spending on Budget	Profit Returns	Window of Opportunity
H1: NSD Culture + Knowledge Sharing ww	–	–	0.469**	0.400*	0.342*
H2: Team Involvement Worldwide	7.697*	0.369*	0.302+	0.322+	–
H3: Cross-Functional Team & Strong Leadership	–	–	–	–	–
H4: Internal Communication & Uses Of IT	–	–	–	–	–
H5: IT Part of New Service	–	–	–	–	–
Intercept	56.029	4.876	4.135	4.389	4.967
R ²	0.062	0.062	0.135	0.111	0.055
Adjusted R ²	0.049	0.051	0.113	0.088	0.043
F of Relationship	4.954	5.364	6.228	4.915	4.680
Significance of Model	0.029	0.023	0.003	0.010	0.034

Note: The following symbols represent levels of significance

** = 0.01

* = 0.05

+ = 0.10

– = Not Significant

3.3.3 Summary of Regression Results

In summary, the results of the regression analysis showed that while both the “what” and the “how” models are relevant to obtaining positive performance in global NSD programs, they seem to play a differential role when specific performance outcomes are targeted. In other words, depending on the specific performance objectives, the regression results indicate that managers must focus on different sets of NSD process factors. A second overall result indicated by the regression analysis is that, while all six of the “what” NSD process factors were found to be significant, only two of the five “how” factors appear to play a role in achieving global NSD outcomes. Yet, the literature indicated that these additional three factors are important. This led to a third, and final, analysis of the data in question, which was justified as follows. Given that this study focused on new service “programs”, it included a wide variety of NSD projects covering the entire spectrum of success/failure outcomes, with a large proportion falling in the mid-ranges. Thus, some of the results may not be significant because too many programs describe the average. As a consequence, the results of the regression analysis, although providing some idea about the really key determining success factors, may not provide enough information to answer the research question: what are all of the factors that are relevant for achieving successful outcomes in global NSD endeavors of firms? This led to the final analysis, involving independent t-tests of NSD process factor means, which describe only the extreme performance scenarios—that is, highly successful versus much less successful global NSD programs. The results of this analysis are described below.

3.4 Winners vs. Less Successful NSD Programs

Independent t-tests were conducted to examine potential differences between companies that performed extremely well and those that were substantially less successful in terms of performance in their international NSD program. To this end, “polar extreme” groups of NSD programs were identified and independent t-tests were used to compare factor means for the two groups. Specifically, the sample was divided into three groups namely: “winners”, “less successful” and “mid-range” performance programs. Then, means were computed for each of the “what” and the “how” model constructs for the “winners” and “less successful” groups. It was assumed that, if a given factor distinguishes significantly between winner and less successful performers—that is, if means are significantly different for the two groups— then this factor can potentially be linked to the achievement of a given performance outcome.

In the survey, with the exception of “Success Rate”, performance was measured using seven point Likert scales. Thus, in order to create “polar” groupings, for the performance measures of “Spending on Budget”, “Profit Returns”, and “Window of Opportunity”, the sample was split as follows: “winners” were those whose performance was rated between 5 and 7, whereas “less successful” programs were ones which were rated between 1 and 3 on these performance measures. Firms that had rated their NSD programs in the mid-range (i.e., 4) were omitted from the analysis. “Sales Impact” was the only measure calling for a slightly different scheme to split the sample. Here, “winners” are NSD programs, which had been rated by respondents as 6 or 7; “less successful” programs had ratings between 1 and 4. This more idiosyncratic approach was used because the frequency distribution showed a substantial skew to the right. Thus, for

this performance measure, organizations that had answered 5 were removed from the sample. For the “Success Rate” measure, considering that the question dealt with percentages, the NSD program sample was divided according to the top 40% performers (i.e., “winner” programs) and the lower 40% performers (i.e., “less successful” programs). Following is a description of the results obtained from these mean comparisons, for both the “what” and “how” models, starting with performance equations that had resulted in the highest adjusted R^2 for the “what” model in the regression analysis. The description of the results of the analysis provides substantial detail, including: the statistical results themselves, their interpretation and relation to the global NSD literature, and their relevance to anecdotal evidence gathered from the field. (Details of the companies taking part in the interviews are presented in Appendix B).

3.4.1 Results of t-test Analysis: “Window of Opportunity”

The “What” Model

The results of the regression analysis suggested that “what” NSD process factors play the most important performance role (i.e., $\text{Adj.}R^2=0.20$; $\alpha \leq 0.001$), when it comes to achieving a “Window of Opportunity” (i.e., the extent to which the new service program opened up new market opportunities for the firm). The “winner” versus “less successful” analysis substantially supports these findings, but provides further insights. T-tests indicate that five of the six “what” factors had significantly different means for “winners” versus “less successful” programs. Of these, three t-values were significant at the 0.001 level, while two others were significant at the 0.005 and 0.10 levels, respectively.

In terms of the performance measure “Window of Opportunity” (see table 9) “*Glocal*” Input (W4) appears to play the most important role in differentiating “winners” from “less successful” programs. For this factor, winner versus less successful NSD program means were found to be highly, significantly, different ($\alpha \leq 0.001$). In other words, global NSD programs that are successful in opening new “Windows of Opportunity” are those where the firm gathers input from both international and local sources throughout the NSD process. These successful NSD programs are also effective in facilitating the incorporation and coordination of internationally dispersed information and activities. This focus on gathering and evaluating new service-related information at both the global and local level appears to play a key role in identifying important new opportunities in international markets.

This was explained by the vice-president from a pharmaceutical consulting firm who stated that, using a centralized approach to establish their worldwide strategies and having all directors from different countries work closely together throughout the development of their new projects, have opened major market opportunities for their company. Given that their global NSD process allows for easy incorporation of international information, this has allowed them to successfully expand their business into Mexico and Africa.

A partner from a management-consulting firm believes that at least a third of their new services result in new opportunities and, in some cases, there is even more money generated from these new windows of opportunity, particularly in the markets of Europe and North America. He associated their success in finding new windows of opportunity to the strong emphasis that their organization has placed on gathering and sharing information from different countries very early in their NSD process. He also explained that, several years ago, when they were not as effective in gathering internationally dispersed information, their company tended to introduce new services that had already been introduced by competitors. Since they changed their approach, however, not only have they introduced a handful of pioneering services but they have expanded their business to many more countries and, as a result, have generated profits of a substantial magnitude.

Next in importance in distinguishing “winners” from “less successful” NSD programs when “Window of Opportunity” is the performance objective, is *Clear Global Strategy (W6)* ($\alpha \leq 0.005$) and *Up-Front Homework (W2)* ($\alpha \leq 0.005$). This result is not surprising. Clearly, when a company has a clear strategy and carries out its market research early in the NSD process, it can better identify opportunities that have a good fit with the objectives of the firm (Scheuing and Johnson, 1989; Terrill and Middlebrooks, 1996; Cooper and Edgett, 1999). This result also suggests that having a clear strategy in place, and doing the right homework may permit a company to “get its feet wet” in new markets, which eventually helps it to move into worthwhile new directions. The railroad director explains:

“extensive marketing research leads to new opportunities”. For example, economists at this company typically study long-term environmental market opportunities. If there is an increase in housing developments, for instance, then the company can anticipate an increase in the transportation of forest products and will seek to reach such customers before their competitors do.

Two factors, *Detailed Formal NSD Process in Place (W1)* and *Planned Global Launch (W3)*, were also found to be significant but of lesser importance ($\alpha \leq 0.10$) for achieving “Windows of Opportunity”. In other words, implementing a formal set of activities and stages for carrying out the NSD process and having a highly planned launch does not appear to play a major role for opening new opportunities for a firm. As shown above, it is having a strategic focus and being open to all sorts of information that is really important here. Nevertheless, while not of primary importance, these factors may play a role in recognizing key opportunities and moving quickly and methodically in

taking advantage of an opportunity (e.g. making customers aware of new service, being first to market, etc.)

Finally, the results suggest that focusing on *Customer/Partner Input (W5)* does not help in identifying new market opportunities. This result was a little bit surprising considering that this study is dealing with the business-to-business sphere, where customers are usually very aware of their needs (Von Hippel, 1978), and thus might be expected to play a role in identifying new windows of opportunity for the firm. Perhaps the non-significant result can be explained by the fact that if “*Glocal*” *Input (W4)* and *Up-Front Homework (W2)* are indeed carried out, then a window of opportunity will probably be derived from them.

One interviewee noted that, whenever possible, their firm tries to avoid linking with local partners especially for input. This is because they fear that they might be giving clients proprietary information and an opportunity to develop the new service for themselves.

This, of course, is a common concern of service providers who must deal with both the intangibility and thus non-patentability of services (Easingwood, 1986; de Brentani, 1989; 1991).

The “How” Model

The “how” model was only marginally relevant to achieving the “Window of Opportunity” performance objective (i.e., $\text{Adj.}R^2=0.043$; $\alpha \leq 0.05$). Similar to the results of the regression, the t-test analysis of “winner” versus “less successful” NSD programs indicate that only two factors of the five “how” NSD process factors have any discriminatory power, and these only at the 0.10 level. Of these two, the most influential

factor that seems to affect new “Window of Opportunity” is *Team Involvement Worldwide (H2)*. This makes sense because when team members from different countries get involved, new opportunities in different markets can be recognized more easily and the best ones can be chosen. In addition, *NSD Culture and Knowledge Sharing Worldwide (H1)* appears to have some impact. It seems that, the more people are involved in the NSD process, the greater the number of ideas (Easingwood, 1986). This was shown by the director from the railroad company who stated that:

despite the high cost of team involvement worldwide, it is nevertheless encouraged because “you get a wealth of ideas from different people located in different countries”. To this end, the company has implemented weekly conference calls involving employees at all levels, from the president to the frontline, for the purpose of discussing the progress of current NSD projects, as well as for suggestions for new opportunities.

Cross-Functional Team with Strong Leadership (H3) was not a significant factor. Although, it might be significant in measuring other performance measures, it is not significant for identifying new windows of opportunity. This is understandable because team players and leadership is more relevant to bringing a new service project through the stages of the NSD process and to introduce it to market, than to derive a new idea or to “get your feet wet” in a new market. The remaining two factors, namely *Internal Communication and Uses of IT (H4)* and *IT part of New Service (H5)*, were also non-significant. When comparing organizations that do with those that do not rely heavily on IT, there does not appear to have an effect on identifying new market opportunities. Moreover, considering that the factor means for *Internal Communication and Uses of IT (H4)*, are high for both “winners” and “less successful” programs, suggests that IT is simply a normal part of doing business in these firms.

Table 9: "Window of Opportunity" - Comparison of Factor Means/T-tests for Winners vs. Less Successful Performance Programs

WHAT model	W/L	N	Means	Standard Deviation	t-test	α	Rank
W1: Detailed Formal NSD Process in place	L W	27 37	3.5185 4.2514	1.5916 1.3991	-1.953	0.055	4
W2: Up-Front Homework	L W	28 37	3.7619 4.7050	1.4568 1.1457	-2.922	0.005	3
W3: Planned Global Launch	L W	28 40	3.8071 4.4450	1.1706 1.5396	-1.849	0.069	5
W4: "Glocal" Input	L W	26 36	3.6615 4.7528	1.3082 1.1565	-3.470	0.001	1
W5: Customer/Partner Input	L W	25 36	3.9400 4.3333	1.3025 1.2498	-1.188	0.239	NS
W6: Clear Global Strategy	L W	30 40	3.4056 4.4750	1.5669 1.3459	-3.066	0.003	2
HOW model							
H1: NSD Culture + Knowledge Sharing worldwide	L W	27 39	4.3296 4.9154	1.4153 1.4420	-1.635	0.107	2
H2: Team Involvement worldwide	L W	27 38	3.6605 4.4167	1.4723 1.6620	-1.894	0.063	1
H3: Cross-Functional Team & Strong Leadership	L W	30 41	5.1250 5.3232	1.0843 1.1689	-0.727	0.470	NS
H4: Internal Communication and Uses of IT	L W	28 41	5.8929 5.8354	1.1813 1.0271	0.215	0.831	NS
H5: IT part of new service	L W	28 40	4.4464 4.9438	1.1967 1.2879	-1.613	0.112	NS

* Winners (W)/Less successful (L) programs: (W) answered 5-7 on Likert scale; (L) answered 1-3 on Likert scale

3.4.2 Results of t-test Analysis: “Sales Impact”

The “What” Model

The regression results showed that “what” NSD factors account for just over 18% of the variation (i.e., $\text{Adj.R}^2=0.182$; $\alpha \leq 0.001$) in the “Sales Impact” of global NSD programs (i.e., the impact of the new international service program on the firm’s sales over a three-year period). The “winner” versus “less successful” programs analysis further indicates that, when companies seek to achieve high “Sales Impact”, all the factors comprising the “what” model appear to play a role. Factor means for the two groups of NSD programs were significantly different ($\alpha \leq 0.001-0.05$) (see table 10).

When comparing the two groups, having a *Planned Global Launch (W3)* and ensuring “*Glocal*” *Input (W4)* come out as the most important factors ($\alpha \leq 0.001$) distinguishing “winners” from “less successful” programs. *Customer/Partner Input (W5)*, conducting *Up-Front Homework (W2)*, and implementing a *Detailed Formal NSD Process in Place (W1)* are three additional “what” factors that are highly significant ($\alpha \leq 0.005$) for achieving a high “Sales Impact”. Finally, having a *Clear Global Strategy (W6)* ($\alpha \leq 0.05$) also appears to play an important role in differentiating winning from less successful NSD programs in terms of this performance measure.

The importance of these factors as potential determinants of success in NSD is supported in the literature. According to de Brentani (1989,1991) and Cooper and de Brentani (1991), implementing a formal NSD process and having a detailed launch can have a favorable impact on sales by experiencing a high number of sales, an above average market growth, and/or a strong market share. Verhage, Dahringer and Cundiff (1989) state that having a clear strategy is especially important when a company’s main

objective is sales performance. Moreover, in order to introduce a successful new service that impacts sales, in terms of sales volume and market share, extensive marketing research must be conducted (de Brentani, 1989; Edgett and Parkinson, 1994). These findings were supported in the interviews as well.

The director from the railway consulting company stated that, because their top 25% customers account for over half of their revenue, the company must always stay close to their customers. This means meeting with them almost on a bi-weekly basis and studying their profiles carefully in order to keep them satisfied. Keeping customers satisfied usually ensures that they will be repeat purchasers of the new service and will thus help to maintain a high level of sales and a strong market position for the firm. He further stated that, in order to successfully introduce a new service and achieve a high level of sales and market share, as much as possible they try to follow a planned process that ensures that all necessary activities are, in fact, carried out.

The “How” Model

The regression results had shown that “how” NSD process factors explain just a little over 5% of the variation in the “Sales Impact” of global NSD programs (i.e., $\text{Adj.}R^2=0.051$; $\alpha \leq 0.05$). The t-test analysis supports the relevance of the “how” model and suggests that three separate factors are linked to achieving a high “Sales Impact” for the global NSD program. *Team Involvement Worldwide (H2)* ($\alpha \leq 0.01$) is the primary factor distinguishing between “winners” and “less successful” programs for this performance measure. Clearly, it is important to fully understand how a given service must be adapted and sold to customers across different geographical and cultural regions, in order to have a favorable impact on sales (Levitt, 1983; Chiesa, 1996, 2000). Consequently, making use of expert personnel to interact with clients can have a positive impact on sales performance (de Brentani, 1989). This was supported by the vice-president from the financial/insurance firm who explained:

team involvement is key to success, and international new services cannot be successful in the absence of input from frontline personnel, especially in such a competitive marketplace. For example, in expanding their business to India, where group insurance plans were almost nonexistent, this company acquired a high percentage of market share by having employees from both India and other countries interact with local customers in order to design package plans that would suit their specific needs. He further stated that their lead in market share and continuous increase in number of sales could be partly attributed to the close relationships their experts have with their customers.

Having a *NSD Culture where Knowledge is Shared Worldwide (H1)* as well as a *Cross-Functional Team with Strong Leadership (H3)* were also found to be important in distinguishing between “winners” that achieve high sales and “less successful” programs ($\alpha \leq 0.05$). This suggests that successful organizations consistently have stronger leadership and greater knowledge sharing among cross-functional teams and across geographically dispersed units. This seems to make a great deal of sense because if a team’s integration is properly executed and information is shared within the organization at the global scale, the cross-functional team is known to substantially improve the firm’s performance (Denison, Hart and Kahn, 1996; Bishop, 1999).

As with the “Window of Opportunity” performance scenario, *Internal Communication and Uses of IT (H4)* was found to be non-significant for achieving a high “Sales Impact”. Once again, this may be the result of high factor means for both groups (5.6667(L) vs. 5.9318(W)), implying that all firms have implemented a reasonable level of IT for internal communication. *IT Part of New Service (H5)* was also a non-significant factor with respect to “Sales Impact”. Perhaps this can be explained as follows: in order to achieve higher sales, a company’s service does not necessarily have to consist of IT. This is contrary to some recent articles in the literature that suggest that IT plays an

important role in new service development (Eramilli, 1990, 1992; Knight, 1999; McDermott, Kang and Walsh, 2001). A possible explanation for its lack of significance in this study could be that the NSD programs are all of a business-to-business nature — whereas most of the NSD literature focused on consumer services— and IT plays a much less prominent role as an integral part of the business services.

Table 10: “Sales Impact”: Comparison of Factor Means/T-tests for Winners vs. Less Successful Performance Programs

WHAT model	W/L *	N	Means	Standard Deviation	t-test	α	Rank
W1: Detailed Formal NSD Process in Place	L W	40 31	3.6350 4.7000	1.4076 1.3743	-3.195	0.002	3c
W2: Up-Front Homework	L W	42 30	4.1310 4.9694	1.1385 1.0847	-3.142	0.002	3b
W3: Planned Global Launch	L W	42 32	3.8857 4.9312	1.1537 1.2573	-3.715	0.000	1
W4: “Glocal” Input	L W	39 30	3.9179 4.9300	1.1989 1.1882	-3.490	0.001	2
W5: Customer/Partner Input	L W	41 29	3.8089 4.7931	1.3589 1.0962	-3.226	0.002	3a
W6: Clear Global Strategy	L W	45 32	3.9370 4.6875	1.3406 1.3936	-2.382	0.020	4
HOW model							
H1: NSD Culture+Knowledge Sharing worldwide	L W	42 31	4.4976 5.1516	1.2577 1.3694	-2.106	0.039	2
H2: Team Involvement worldwide	L W	40 31	3.9125 4.7581	1.4671 1.3689	-2.479	0.016	1
H3: Cross-Functional Team & Strong Leadership	L W	43 33	5.1163 5.5833	1.1185 0.9513	-1.923	0.058	3
H4: Internal Communication and Uses of IT	L W	42 33	5.6667 5.9318	1.1512 1.0667	-1.022	0.310	NS
H5: IT part of new service	L W	42 31	4.6310 4.9435	1.2250 1.4659	-0.991	0.325	NS

* Winners (W)/Less successful (L) programs: (W) answered 6-7 on Likert scale; (L) answered 1-4 on Likert scale

3.4.3 Results of t-test Analysis: “Profit Returns”

The “What” Model

The regression analysis had shown that “what” NSD process factors play a fairly significant role (i.e., $\text{Adj.R}^2=0.148$; $\alpha \leq 0.001$), in attaining *Profits Returns* (i.e., effect of new service program on company’s profits over a three year period). The analysis had identified only two significant “what” NSD process factors. The more focused, winner/less successful program analysis presented below provides more insightful results, indicating that four of the six “what” factors have significant t-values when it comes to “Profit Returns” (see table 11).

The primary factor distinguishing “winners” from “less successful” global NSD programs, in terms of “Profit Returns”, is “*Glocal*” *Input (W4)* ($\alpha \leq 0.005$). According to the results, there is almost a one point difference between the factor means for these two groups (4.7(W) vs. 3.8 (L)), which is highly significant when studying such a wide variety of NSD programs, which themselves comprise averages of projects over a period of three years. This result is not surprising because having a new service that fits customer needs (via glocal input) allows you to charge higher prices and therefore increase profits (Chiesa 1996, 2000), in order to introduce international services that will yield high “Profit Returns”.

For example, one interviewee from the financial/insurance industry explained that input from worldwide locations is gathered and coordinated during the very early stages of the NSD process. If common themes are expressed within the organization internationally, these are then incorporated in the development process while, at the same time, making sure that they meet local needs. He further stated that adopting this approach has led to cost-efficiencies, which in turn greatly contributed to their company being the most profitable within the industry, worldwide.

In addition to the above, conducting *Up-Front Homework (W2)*, having a *Detailed Formal NSD Process in Place (W1)* and *Customer/Partner Input (W5)* were all significant, although somewhat less supported factors ($\alpha \leq 0.05$), when comparing high profit versus lower profit NSD programs. These findings are also supported by the literature. Conducting solid up-front homework increases chances of delivering a profitable service (Edgett, 1996; Cooper, 1999) because when the company has carried out market research, has clear project definitions and has tested market acceptance, it decreases the chances of wasting unnecessary resources that arise from entering the market unprepared. Organizations that use a formal and detailed approach for NSD are also more likely to be successful in terms of profits (de Brentani, 1991; Edgett, 1994). Incorporating customer/partner input during all the stages of the process allows the organization to articulate their needs (Cooper and Edgett, 1999). By understanding and delivering customer needs, they do not waste resources on trial-and-error, and as such unnecessary costs are minimized. Consequently, incorporating these three factors as part of the global NSD process can influence the extent to which the firm can achieve profits.

According to the director from the railroad firm, the fact that they are one of the most profitable companies in the industry is a direct result of the methodical research they conduct and the input that they regularly gather from their customers. Furthermore, since 1999, the firm has been following a much more structured process to develop new services. This, according to the director, has helped the firm reduce monetary resources, and allowed it to charge higher prices for the services rendered, thus generating greater profits.

In contrast, the director from the telecommunications company stated that they did not have any formal NSD process in place. Indeed, they often did not conduct any marketing research and, sometimes, even introduced new services without first consulting customers for input. Often, these new services failed to meet profit objectives. Typically, when they developed new services for global markets they tended to use a trial-and-error

approach. He even explained that, in general, when new ideas for services had not originated from customers, these tended to fail.

It is not difficult to conclude from these two anecdotes that the three NSD process factors —*Up-Front Homework (W2)*, *Detailed Formal NSD Process in Place (W1)* and *Customer/Partner Input (W5)*— play an important role in ensuring a profitable NSD program. In the latter case, even though the firm was a market leader, it incurred unnecessary costs that could not be absorbed by their high sales, thus explaining their lack of profitability.

Two NSD process factors in the “what” model were not significant with respect to “Profit Returns”: *Clear Global Strategy (W6)* and *Planned Global Launch (W3)*. This finding was rather surprising. Past research has shown that, in the domestic market, a clear strategy (Scheuing and Johnson, 1989; Terrill and Middlebrooks, 1996) and a detailed launch (de Brentani, 1991) can help organizations in generating profits. Thus, the expectation was that this would also be relevant for global NSD. Perhaps Lovelock’s (2001) contention that many companies that operate in several countries do not implement a coherent international strategy explains why *Clear Global Strategy (W6)* was not significant in distinguishing between “winning” and “less successful” firms. In other words, firms that treat each country differently, each with a separate and distinct country-based strategy might also be capable of yielding profits for their international NSD program.

Regarding the *Planned Global Launch (W3)* factor, Nicoulaud (1980) encourages the use of a well-thought out commercial introduction for new global products. Yet, studies have shown that services are often introduced without verifying that their offer

complies with customer needs and functional specifications (de Brentani, 1989). Thus, services might be successful in terms of profits for both “winners” and “less successful” programs even in the absence of a carefully planned launch. In many cases, a detailed global launch may not be feasible because countries may be considered to be completely different entities with substantial differences in culture or even distinct sets of government regulations.

Indeed, in four of the interviews, respondents whose companies are leaders in their industries stated that for their new services, they did not use any formal procedure during their international launch. Instead, given the nature of the service (i.e., business-to-business), launching their new service consisted of communicating it to their customers informally, during one of their face-to-face meetings.

Their success, despite the lack of a formal launch, may also be attributed to the fact that many of these companies rely on repeat sales from existing customers for profit returns.

The “How” Model

In the “how” model, the primary factor ($\alpha \leq 0.001$) distinguishing winners from less successful programs in terms of the “Profit Returns” is *NSD Culture and Knowledge Sharing Worldwide (H1)*. This is in accordance with both what was found in the regression analysis (Table 8) and with what is found in the literature. Nicoulaud (1980) strongly emphasizes the need for service marketers to gather and share information about potential customers from different countries. The more capable a company is at sharing and communicating information within the organization worldwide, the more efficient it will be in addressing customer needs, and the lower the costs associated with developing the new service, ultimately yielding greater profits.

A manager from a successful accounting firm explained that, when developing international new services, management strongly encourages both contributions from NSD team members located in different countries, as well as responsiveness to differences in local markets. He further stated that knowledge sharing, worldwide, is encouraged because their company is zealous about being the first to enter the market with a new service. For example, if a client in Canada needs a service that is similar to one provided in Europe, management can quickly tap the existing knowledge of their European employees, in order to accommodate the Canadian client with a “new” service.

Thus, knowledge sharing in NSD leads to both customer satisfaction and to reduced costs and, therefore, to higher profitability of the new service development program. Moreover, sharing information within the organization on a global scale can lead to the introduction of a pioneering service, that leads to greater profits by achieving competitive advantage (Urban and Hauser, 1993).

Team Involvement Worldwide (H2) and *Cross-Functional Team and Strong Leadership (H3)* were two additional factors significant for achieving profit performance ($\alpha \leq 0.05$). Clearly, cross-functional teams that are led by strong leaders tend to have better control over the development process and, thus, tend to introduce new services that are more profitable. Clear focus, less wasted effort and different ways of looking at problems can all play a role in achieving this end.

In one interview with the vice-president from the pharmaceutical consulting firm, the participant stated that, in their fiscal year 2000, although they had met their sales objectives, they had not met their profit objectives. This was because the company had been acquired that year and the primary emphasis had been on the details of the acquisition, rather than on new service development. This resulted in a lack of both leadership and project focus. Since then, they have changed their approach in managing new projects and their costs, yielding substantially more profitable outcomes.

As in the other two performance scenarios, *Internal Communication and Uses of IT (H4)* and *IT Part of New Service (H5)* are two “how” factors that appear not to have any significant effect with regard to profitability for global new services. Again, factor means were relatively high for both groups, suggesting that both “winners” and “less successful” programs use IT in similar ways, but that this does not make a difference for achieving profit objectives.

Table 11: “Profit Returns”: Comparison of Factor Means/T-tests for Winners vs. Less Successful Performance Programs

WHAT model	W/L	N	Means	Standard Deviation	t-test	α	Rank
W1: Detailed Formal NSD Process in Place	L W	23 45	3.5652 4.4333	1.3878 1.4460	-2.374	0.021	3
W2: Up-Front Homework	L W	23 45	4.0217 4.7389	0.9966 1.1790	-2.495	0.015	2
W3: Planned Global Launch	L W	24 46	4.0917 4.4913	1.3730 1.3726	-1.156	0.252	NS
W4: “Glocal” Input	L W	23 42	3.8348 4.7643	1.1964 1.1844	-3.015	0.004	1
W5: Customer/Partner Input	L W	22 43	3.8939 4.5504	1.3229 1.1771	-2.040	0.046	4
W6: Clear Global Strategy	L W	26 47	3.7436 4.2128	1.3994 1.5377	-1.288	0.202	NS
HOW model							
H1: NSD Culture + Knowledge Sharing Worldwide	L W	24 45	4.1583 5.2156	1.1780 1.2617	-3.391	0.001	1
H2: Team Involvement worldwide	L W	21 46	3.6190 4.5326	1.3511 1.4175	-2.482	0.016	2
H3: Cross-Functional Team & Strong Leadership	L W	24 50	4.8125 5.4050	1.0458 1.1494	-2.135	0.036	3
H4: Internal Communication and Uses of IT	L W	25 47	5.6000 5.8564	1.2416 1.0198	-0.941	0.350	NS
H5: IT part of new service	L W	25 47	4.6000 4.8883	1.2990 1.3082	-0.892	0.375	NS

* Winners (W)/Less successful (L) programs: (W) answered 5-7 on Likert scale; (L) answered 1-3 on Likert scale

3.4.4 Results of t-test Analysis: “Success Rate”

The “What” Model

The regression analysis had indicated that only two of the six “what” NSD process factors had any effect on “Success Rate” (i.e., $\text{Adj.R}^2=0.054$; $\alpha \leq 0.05$). Yet, this more focused t-test analysis comparing “polar extremes”—successful versus less successful global NSD programs—provides more depth and suggests that all six “what” factors play a significant role—three factors at the 0.01 level, two at the 0.05 level and one at the 0.10 level—when it comes to “Success Rate” (see table 12).

In terms of “Success Rate” (i.e., percentage of projects that were developed and regarded as commercial successes), the primary factor distinguishing between successful and less successful international new service programs is having a *Clear Global Strategy* (W6). The factor means for the two groups were significantly different (3.5619 (L) vs. 4.6886 (W)) ($\alpha \leq 0.001$), which indicates that this NSD process factor could be an important determinant of this form of performance. Moreover, the results indicate that companies that do their *Up-Front Homework* (W2) ($\alpha \leq 0.01$) and that ensure “*Glocal*” *Input* (W4) ($\alpha \leq 0.01$) tend to achieve higher success rates when developing new services for global markets.

These findings are in accordance with what is found in the literature. When organizations have a clear NPD strategy in place, this provides a clear direction for the firm’s new product effort and typically leads to fewer failed attempts at developing new products (Booz, Allen, and Hamilton, 1982; Scheuing and Johnson, 1989; Terrill and Middlebrooks, 1996; Griffin, 1997). According to Booz, Allen, and Hamilton (1982), implementing a clear strategy can dramatically reduce the number of ideas (from 58 in

1968, to 7 in 1982) that need to be considered for every new product that eventually succeeds. Not surprisingly, conducting up-front homework—that is, developing project definitions, conducting market research, focusing on unique customer benefits and testing market acceptance in designing the service—also is shown to have a favorable impact on the “Success Rate” of global NSD programs. This is because, carrying out these activities increases the probability that a new service will meet the company’s minimum objectives and, thus, be considered a “success”. Moreover, as shown in previous studies of NPD/NSD and also in the globalization literature, making sure that you understand your customer and market requirements (Nicoulaud, 1980; Cooper and de Brentani, 1991; Edgett, 1996; Cooper and Edgett, 1999) as well as cultural differences (Nicoulaud, 1980; Nakata and Sivakumar, 1996; Knight, 1999) is essential to yield successful services. “Glocal” input is also necessary for understanding potential customers’ perceptions of the service at the local and international level, and to communicate the information about the new service within the organization (Nicoulaud, 1980; Nakata and Sivakumar, 1996; Lovelock, 2001). This allows firms to ascertain that at least the minimum criteria are being delivered to customers.

In addition to the above, two secondary factors—i.e., implementation of a *Formal NSD Process (W1)* and carrying out a *Planned Launch (W3)* for the international market—significant at the 0.05 level, appear to also affect “Success Rates” in global NSD. This result is also supported in the literature. Past studies conducted on NPD and NSD reveal that implementing a formal NSD process is significantly linked to the rate of success of new products and services (de Brentani, 1989, 1991; Cooper, Easingwood, Edgett, Kleinschmidt, and Storey, 1994; Cooper and Kleinschmidt, 1995; Griffin, 1997).

Moreover, carrying out a well-thought out launch program increases the chances of introducing a successful service (de Brentani 1991; Edgett, 1996), especially in the international arena (Nicoulaud, 1980).

Customer/Partner Input (W5) is a factor that appears to be only of marginal importance ($\alpha \leq 0.10$) in distinguishing high versus low performers in terms of “Success Rate”. Perhaps this factor is of less importance because, if up-front homework is a clear phase in the NSD process, then the need for direct customer input becomes less relevant, since, the needs of customers are already taken into account. Moreover, as mentioned earlier, anxiety about revealing valuable proprietary information to customers and potential competitors may play a role.

For example, as the vice-president from the environmental engineering consulting firm explained: although they link with local partner units in order to be able to develop their technology locally, the success of the service is primarily determined by their own company effectively conducting up-front research in order to meet their customer’s needs during service delivery. The majority of their projects have been successful because they do not provide or share information with partners, who can easily copy the new service.

The “How” Model

The regression analysis had shown that only one of the five “how” NSD process factors had any effect on “Success Rate” (i.e., $\text{Adj.}R^2=0.049$; $\alpha \leq 0.05$). The findings of this t-test analysis also point to this one overwhelming factor, which distinguishes firms with a high versus low “Success Rate”. This factor is *Team Involvement Worldwide (H2)* ($\alpha \leq 0.01$). This result is not surprising, because if everyone involved knows and understands what must be delivered to customers, then chances of delivering a successful international new service increases (McDonough, Kahn and Barczak, 2001). In this study, programs that had high “Success Rates” typically revolved around teams that were

made up of members from different countries who met and communicated decisions with their geographically dispersed colleagues.

Internal Communication and Uses of IT (H4) ($\alpha \leq 0.05$) as well as *NSD Culture/Knowledge Sharing (H1)* ($\alpha \leq 0.10$) were found to be significant, but secondary factors in describing how best performing programs achieve higher NSD “Success Rates” than their less successful counterparts. In global NPD, the better the communication process, the better the chances of success (Knight, 1999; McDermott, Kang and Walsh, 2001). Thus, companies need to communicate and share knowledge across geographically dispersed units using all means, including IT-based e-mail, Internet, videoconferencing, etc.

Two factors, according to the t-test analysis, appear not to have had any significant effect in achieving a high “Success Rate” for new international services. These include *IT-Part of New Service (H5)* and *Cross Functional Teams with Strong Leadership (H3)*. As was explained for “Sales Impact”, the business-to-business nature of this study may explain the first of these non-significant outcomes. This was corroborated by the manager from an accounting firm:

although most of the projects that the company has undertaken over the last three years have met the minimum criteria and have been perceived as successful, their services do not necessarily consist of IT. IT simply assists them in carrying out their job more efficiently; but the actual service offered and its success are usually dependent on the quality of interaction between the client and the service supplier.

Thus, “Success Rate” may not be related to IT because business-to-business services typically do not entail IT as an integral part of the service offering.

The second non-significant factor relating to NSD “Success Rate” is *Cross-Functional Team and Strong Leadership (H3)*. At first, this result seemed surprising. This is because both the NPD and NSD literatures emphasize the importance of cross-functional teams in achieving success (Adler, Riggs and Wheelright, 1989; Cooper, 1993; Urban and Hauser, 1993; Bishop, 1999) and the expectation that this would also be relevant for global NSD seemed reasonable. Analyzing the results in more detail, however, suggests the following explanation: both group means were relatively high (5.0294 (L) vs. 5.4063(W)), suggesting that companies, regardless of whether they have “winning” or “less successful” programs, seem to use cross-functional teams and have strong leadership. Thus, in the global situation, very possibly the key to success is to place substantial emphasis on creating cross-country teams, rather than cross-functional teams; this, in order to ensure effective “*Glocal*” Input (W4) and a *Clear Global Strategy* (W6), both of which are essential for achieving success in international markets.

Table 12: "Success Rate" - Comparison of Factor Means/T-tests for Winners vs. Less Successful Performance Programs

WHAT model	W/L	N	Means	Standard Deviation	t-test	α	Rank
W1: Detailed formal NSD process in place	L W	31 39	3.4323 4.1974	1.4010 1.4365	-2.238	0.029	4
W2: Up-Front Homework	L W	32 38	3.9323 4.7697	1.2978 1.1546	-2.856	0.006	2
W3: Planned Global Launch	L W	31 39	3.8581 4.5795	1.2047 1.4965	-2.180	0.033	5
W4: "Glocal" Input	L W	31 37	3.6968 4.5324	1.3063 1.2974	-2.637	0.010	3
W5: Customer/Partner Input	L W	31 36	3.8387 4.3935	1.3162 1.2650	-1.757	0.084	6
W6: Clear Global Strategy	L W	35 38	3.5619 4.6886	1.5185 1.2352	-3.490	0.001	1
HOW model							
H1: NSD Culture + Knowledge Sharing worldwide	L W	30 38	4.4200 4.9789	1.2096 1.3989	-1.735	0.087	3
H2: Team Involvement worldwide	L W	31 37	3.5591 4.5495	1.3399 1.4813	-2.867	0.006	1
H3: Cross-Functional Team & Strong Leadership	L W	34 40	5.0294 5.4063	1.2321 0.9702	-1.471	0.146	NS
H4: Internal Communication and Uses of IT	L W	34 38	5.3971 5.8882	1.1856 0.9385	-1.959	0.054	2
H5: IT part of new service	L W	34 39	4.8529 4.6603	1.1840 1.4264	0.622	0.536	NS

* Winners (W)/Less successful (L) programs: (W) performed in the top 40 %; (L) performed in the low 40%

3.4.5 Results of t-test Analysis: “Spending on Budget”

The “What” Model

The regression analysis results suggested that only one “what” NSD process factor as having a significant effect (i.e., $\text{Adj.R}^2=0.024$; $\alpha \leq 0.10$), in achieving the “Spending on Budget” performance objective. The t-test analysis comparing factor means for successful versus less successful NSD programs, provides greater insight. According to these results, five of the six “what” NSD process factors appear to be relevant (see table 13).

The most important factors that appear to influence the performance measure “Spending on Budget” (i.e., the extent to which the new services of the firm’s international NSD program were developed on budget) are *Up-Front Homework (W2)* ($\alpha \leq 0.001$) and *Planned Global Launch (W3)* ($\alpha \leq 0.005$). For the first factor, this makes a great deal of sense considering that if a firm conducts its homework properly, chances are it will also do a good job in estimating costs of the new service project and make fewer mistakes. Clearly, by taking the time to do up-front homework, a firm can anticipate problems earlier before they become too expensive to fix (Cooper and Edgett, 1999). Also, analyzing the idea early in the development process, allows firms to identify projects that reflect the objectives and resources of the organization and that appear to have potential for successful development (Booz, Allen, and Hamilton, 1982; Griffin, 1997; Cooper, 1999). Companies that undertake early assessments of their NSD costs, probable sales, capital investments and profit projections of the project(s) verify that they fit with the company’s resources and financial objectives (Booz, Allen, and Hamilton, 1982; Terrill, 1992). Cooper (1999) believes that one possible explanation of why firms

perform poorly in their program is poor up-front homework, which usually leads firms to require more resources than what they had expected. This finding was corroborated by at least two interviewees who took part in the case studies.

The director of a telecommunications firm stated that not conducting up-front homework typically leads to high and unexpected costs that, even in cases where sales are high, do not generate profits for the company. Another interviewee from a financial/insurance firm indicated that part of the reason they are one of the top companies in their industry is because they always do their up-front customer and product research, allowing them to complete projects within the allocated budget.

Having a clearly *Planned Global Launch (W3)* as part of the NSD process also seems to favorably impact global NSD performance in terms of the spending measure. Commercialization is usually the highest cost stage of the NPD process (Booz, Allen, and Hamilton, 1982; Urban and Hauser, 1993), particularly when going international (Lovelock, 1999, 2001). Thus, companies that include a well-thought out launch stage have a greater likelihood of spending within their budget constraints (de Brentani, 1991; Edgett, 1996).

Two additional factors defining the “what” model were significant but of a secondary nature ($\alpha \leq 0.05$) with respect to the spending performance measure. These included *Clear Global Strategy (W6)* and “*Glocal*” *Input (W4)*. Defining and developing NSD strategies that embody goals and resources at the global level (Devinney, 1995; Chiesa, 2000) makes sense, because companies that have established a clear strategy are also more likely to have carefully devised plans to implement these within established budget constraints. In other words, defining a clear strategy allows managers to properly allocate resources (Terrill, 1992). Moreover, gathering information from different foreign markets and adapting the new service to local customer needs and perceptions is

important (Nicoulaud, 1980; Cooper, 1999). This can prevent the company from spending money on new service developments that do not meet customer requirements. Therefore, cost drivers must be considered when wishing to introduce a new service to the global market (Lovelock, 2001).

Having a *Detailed Formal NSD Process in Place (W1)*, according to the t-tests, is also of some importance ($\alpha \leq 0.10$) when it comes to keeping “Spending on Budget”. Companies that have a formal NSD process in place can reduce the failure rate of their new services and consequently minimize the allocation of valuable resources to new services that eventually fail (Zirger and Maidique, 1990; Urban and Hauser, 1993). The somewhat lower significance of this factor can be explained by the fact that a majority of service firms —successful and less successful—do not use a formal NSD process (de Brentani, 1989, 1991, 2001; Griffin, 1997). Thus, the true importance of this factor is probably understated.

Finally, the group means for the *Customer/Partner Input (W5)* factor were not significantly different, suggesting that it has no bearing on achieving the performance measure of “Spending on Budget”. This may be explained by the fact that information pertaining to budget expenditures does not necessarily require input from customers or partners. Moreover, as the vice-president from an insurance/financial firm indicated, although customer input can be useful for ensuring that the right service is developed from the start, and thus decrease costs of later adaptations, nevertheless constant customer involvement, can be a very costly undertaking.

The “How” Model

The results of the regression analysis suggested that “how” NSD process factors play the most important performance role, when it comes to “Spending on Budget” (i.e., $\text{Adj. } R^2=0.113$; $\alpha \leq 0.005$). The t-test analysis supports these earlier findings. According to the results, *NSD Culture and Knowledge Sharing Worldwide (H1)* appears to be a primary “how” factor ($\alpha \leq 0.005$) when the aim is to spend on budget. When comparing means, the “winners” were on average, one point higher than the “less successful” performers (5.3 vs. 4.3, respectively), which is significant when looking at programs, which are averages in themselves. This is not a surprising result. It makes sense that organizations that have a better control over expenditures are those that focus on creating communication systems that actually work and that information sharing between geographically dispersed units is highly effective.

Two additional factors also appear to affect global NSD with regard to “Spending on Budget”. These include *Cross-Functional Team with Strong Leadership (H3)* ($\alpha \leq 0.05$) and *Team Involvement Worldwide (H2)* ($\alpha \leq 0.1$). NSD programs that are “on budget” tend to have stronger leaders and their teams comprise different disciplines. This is not a new finding: poor leadership and inadequate communication among team members can obviously lead to unnecessary expenses (Bailey, 2000; Moenart, Vaeldries, Lievens and Wauters, 2000); and NSD programs that have excellent teams led by strong leaders can be expected to have a better hold over expenditures (Hitt, Nixon and Kochhar, 1999; Bailey, 2000). Moreover, because cross-functional teams are known to look at problems in different ways, they therefore, are more likely to come up with more efficient solutions (Denison, Hart and Kahn, 1996).

This finding was corroborated by the director from the telecommunications company who explained that, although they had met sales objectives, they were not profitable because they had very poor control over their expenditures. He attributed this lack of control to the fact that project leaders did not follow the projects through from the beginning to end. Moreover, although teams were cross-functional, members did not work together as a real team. Each function worked independently from the other (i.e., silo effect), and international NSD teams consisted solely of local members.

According to the t-test results, *Internal Communication and Uses of IT (H4)* and *IT Part of New Service (H5)* were not significant discriminators between “winning” and “less successful” global NSD programs. What this suggests is that both groups use IT extensively, but that this does not impact whether the global NSD effort is in line with budget objectives.

Table 13: “Spending on Budget” - Comparison of Factor Means/T-tests for Winners vs. Less Successful Performance Programs

WHAT model	W/L *	N	Means	Standard Deviation	t-test	α	Rank
W1: Detailed Formal NSD Process in Place	L W	24 33	3.8333 4.5212	1.4550 1.4534	-1.763	0.083	5
W2: Up-Front Homework	L W	26 33	3.9744 4.9848	1.1951 0.9784	-3.572	0.001	1
W3: Planned Global Launch	L W	26 34	3.8231 4.7765	1.2953 1.2336	-2.903	0.005	2
W4: “Glocal” Input	L W	25 31	4.0640 4.8065	0.9622 1.4241	-2.227	0.030	4
W5: Customer/Partner Input	L W	24 31	3.9444 4.5484	1.3028 1.3487	-1.671	0.101	NS
W6: Clear Global Strategy	L W	28 34	3.7857 4.5882	1.3584 1.3585	-2.315	0.024	3
HOW model							
H1: NSD Culture + Knowledge Sharing Worldwide	L W	25 33	4.3200 5.3758	1.3140 1.2716	-3.087	0.003	1
H2: Team Involvement Worldwide	L W	25 32	3.9867 4.7604	1.5649 1.5479	-1.864	0.068	3
H3: Cross-Functional Team & Strong Leadership	L W	26 35	4.9712 5.5214	1.3681 0.7938	-1.977	0.053	2
H4: Internal Communication and Uses of IT	L W	27 33	5.7778 5.7727	1.1294 1.0613	0.018	0.986	NS
H5: IT part of new service	L W	28 33	4.7857 4.9848	1.2651 1.2468	-0.617	0.539	NS

* Winners (W)/Less successful (L) programs: (W) answered 5-7 on Likert scale; (L) answered 1-3 on Likert scale

VII DISCUSSION

1 Summary of Analysis and Results

This thesis dealt with new service development for global markets in the business-to-business sector. The objectives of this study were: to identify the factors that describe the global NSD process of firms—that is, the stages and activities undertaken to identify, develop and commercialize new services—and to determine which of these factors appear to have an effect on the performance of firms. Because NPD performance can mean different things to different firms and in different situations, five variables were used to measure performance and these were related to the NSD process factors. The statistical analysis was conducted on a sample of firms that develop new services directed at international/global markets. The study looks at the NSD programs of these firms—that is, new service projects undertaken over a three-year period—which are aimed at business customers. The sample consisted of 105 service firms, where each firm described the NSD process used, in terms of 43 variables. This revolved around five process-related constructs, (which in turn were composed of variables themselves): the NSD process (NSD activities, reduction of haphazardness, quality of execution, integration of internationally dispersed information), the NPD Team (how the program team is organized, training of frontline, and global nature of organization), the NPD Strategy (extent of formalization of the organizational structure, level of expertise, degree of globalization), the NSD Culture (firm's internal innovation culture, extent of involvement by senior partners, involvement across globally dispersed units) and the NSD Communication and Technology (level to which technology is used to communicate globally, extent to which service is technologically based). In addition, five measures were used to assess the performance of the global new service programs.

These included: “Success Rate” (percentage of projects that were developed and regarded as commercial successes), “Sales Impact” (the impact of the new service program on the firm’s sales over a three year period), “Spending on Budget” (the extent to which the new services of the firm’s international program were developed on budget), “Profit Returns” (effect of new service program on the company’s profits over a three year period) and “Window of Opportunity” (the extent to which the new service opened up new market opportunities for the firm).

Identifying the constructs that describe the global NSD process in the context of business-to-business services —that is, the descriptive analysis— was the first step necessary in order to achieve the goal of this study. On careful inspection of the variables, and keeping in mind Cooper’s (1998) recent reminder that performance is driven by the nature (i.e., “what” the NSD process is made up of) and quality (i.e., “how” the NSD process is carried out) of the process, there appeared to be two distinct sets of variables comprising the global NSD process: those describing “what” the NSD process should encompass and those describing “how” the NSD process should be carried out. Thus, two separate principal component analyses (Varimax-rotation) were carried out, which led to eleven dimensions —six “what” (W) and five “how” (H)— that describe the NSD process used for developing new business-to-business services for global markets. Reliability for each of the eleven factors identified in the principal component analyses was assessed using Cronbach Alpha values. According to Nunally (1978), the reliability values complied with the minimum value of 0.5 for exploratory research. The constructs examined in this study, therefore, show internal consistency.

The first model describing the global NSD process of service firms, called the “what” model, consists of six factors that comprise 27 variables. The first construct, *Detailed Formal NSD Process in Place*, describes whether firms include a standardized set of stages to guide their global new service developments from idea generation to launch. *Up-Front Homework* is the second construct, representing the activities that should be carried out prior to designing a new service. The third dimension, *Planned Global Launch*, refers to the course of action taken by firms when commercializing their new services. “*Glocal*” *Input*, the fourth dimension of the “what” model describes the method used to gather and incorporate information from geographically dispersed units of an organization. The fifth dimension, *Customer/Partner Input*, represents the involvement from external sources such as customers and other associates. The last construct in this model, *Clear Global Strategy*, refers to the need for a detailed and clear NPD strategy driving the development of a new service directed at the international market.

The second model, called the “how” model, includes 16 variables that describe five factors of the NSD process. The first dimension, *NSD Culture/Knowledge Sharing Worldwide* describes the NSD culture of the organization and how companies share information internally, worldwide. *Team Involvement worldwide*, the second construct, refers to the level of collaboration among geographically dispersed team members in developing international new services. The third dimension, called *Cross-Functional Team with Strong Leadership*, describes the functional nature of teams and the role played by the leaders. *Internal Communication and Uses of IT*, the fourth construct, demonstrates the role IT has played in internationalizing the new service and in

communicating within the firm. Finally the last construct of the “how” model, *IT part of New Service*, describes the impact advances in IT have on accessing foreign markets and customizing services for global markets.

Three “Relational Analyses” followed the descriptive phase with the objective of identifying which of the NSD process factors appeared to have a potentially determining impact on NSD performance. The first of these relational analyses consisted of a bivariate Pearson correlation analysis of each of the “what” and “how” dimensions to discover which of the factors are significantly correlated with the performance variables. Next, stepwise regressions were conducted to determine potential “causal” relationships between the descriptive NSD process factors and the performance outcomes. Because the sample dealt with NSD programs, which included a broad range of projects at all levels of performance, a third analysis was undertaken that would minimize the impact of mid-range, or average, performance-level projects. Thus, the final step in the analysis consisted of splitting the sample into two groups to evaluate the extent to which the “what” and “how” NSD process factors distinguish between winners and less successful programs. Because NSD programs (over three years) involve a wide variety of projects and a broad range of successes and failures, it was felt that comparing NSD programs that had a high overall rating of success with the obvious “less successful” programs—that is, eliminating the average or middle—would provide more insight about what NSD process factors impact global new service success.

In order to get an overview of the results, each performance measure was ranked with each of the “what” and “how” factors of the NSD process, according to the results obtained from the comparison between winning and less successful programs. Then, the

values of the ranks were added for each NSD process factor to determine its overall importance (see table 14). The results show that in “what” the NSD process should encompass, two factors appear to have an overwhelming impact on the different measures of performance; whereas the other four dimensions, although significant, tend to be of secondary importance (see table 14). Specifically, programs that include in their NSD process *Up-Front Homework* and “*Glocal*” *Input* are more likely to be winner programs. Having a *Clear Global Strategy*, and *Planning a Global Launch* are also expected to yield successful service programs. Furthermore, implementing a *Detailed Formal NSD Process* and taking into consideration *Customer/Partner Input* are critical determinants of successful service programs (i.e., winner programs).

As to “how” the NSD process should be carried out, two factors appeared to play a primary role in determining performance, with a third construct having a significant, but secondary effect. Two additional factors were found to be not significant in relation to the performance measures under study (see table 14). Global NSD programs, where the process places great emphasis on *Team Involvement Worldwide*, as well as on an innovative corporate *Culture and Knowledge Sharing Worldwide* are more likely to be winners. In other words, NSD teams that include members from different countries and organizations that stress knowledge sharing across different geographical subunits are more likely to have successful international new service programs. In addition, ensuring that the NSD team is *Cross-Functional Team with Strong Leadership* is also quite important in distinguishing winner programs from the less successful ones. Finally, *IT as Part of the New Service* and *Internal Communication and Uses of IT* do not seem to have

a bearing on whether global NSD programs are more or less successful. These outcomes will be discussed in detail in the next section.

As mentioned in the previous section, most of the findings in this study are confirmed in the literatures on NPD/NSD, globalization and services marketing. Moreover, interviews with managers, directors and vice-presidents from several service firms supported and, in many cases, helped to explain the results of this analysis. Interviewees, when asked to articulate what drives new service performance for international markets in their organization, often mentioned many of the concepts that were identified in the current analysis. Thus, findings of this study regarding the NSD process appear to be valid and relevant with respect to business-to-business services geared toward the international market. Taking into consideration that this study is of an empirical nature, it can be assumed that these findings could be relevant in real life situations and that they could be used by managers who wish to improve their organization's success potential when developing new services for international markets.

Table 14⁴: Ranking of performance measures with each factor of the NSD Process

WHAT model	Success Rate	Sales Impact	spending on budget	Profit Returns	Window market	summary of ranks	overall importance ranking
W1: Detailed formal NSD process in place	4*	5**	5+	3*	4+	21	4
W2: Up-Front Homework	2**	3**	1***	2*	3**	11	1
W3: Planned Global Launch	5*	1***	2**	6-	5+	19	3
W4: "Glocal" Input	3**	2***	4*	1**	1***	11	1
W5: Customer/Partner Input	6+	4**	6-	4*	6-	26	5
W6: Clear Global Strategy	1***	6*	3*	5-	2**	17	2
HOW model							
H1: NSD Culture+ Knowledge Sharing ww	3+	2*	1**	1***	2+	9	2
H2: Team Involvement worldwide	1**	1*	3+	2*	1+	8	1
H3: Cross-Functional Team & Strong Leadership	4-	3+	2*	3*	4-	16	3
H4: Internal Communication & Uses of IT	2+	4-	5-	4-	5-	20	4
H5: IT part of new service	5-	5-	4-	5-	3-	22	5

Note: The following symbols represent levels of significance

*** = 0.001 + = 0.10
 ** = 0.01 - = not significant
 * = 0.05

⁴ Each performance measure was ranked with each of the "what" and "how" factors of the NSD process, according to the results obtained from the comparison between winning and less successful programs (i.e. t-test analyses). Then, the values of the ranks were added for each NSD process factor to determine its overall importance.

2 Managerial Implications

The NSD process is not only important for NSD success but it is also a component that can be manipulated or adapted by the firm. This is in contrast to other determinants of NSD success —e.g. market environment or technological capabilities— which firms cannot impact in a proactive way in the short and often even in the long run. Therefore, the results from this study are important because they can be used by managers in order to positively impact the performance of new services aimed at the global markets. The nine factors that distinguish between winning and less successful NSD programs, can provide some guidance as to **what** managers should focus on when installing an NSD process for their firms, and **how** managers should handle various aspects of the process when developing new services for international markets. A discussion about the nature (i.e., what) and the quality (i.e., how) of the global NSD process and their implications follows.

2.1 “What” should be incorporated in the global NSD process

The factors described in the “what” model are all important factors that managers need to incorporate in the global NSD process. Of top priority when establishing a global NSD process is to set up a system that ensures conducting up-front homework and gathering “glocal” input. In addition, the results in this study suggest that the global NSD process should have a clear global strategy, entail a detailed and formal set of activities and gates, a planned global launch program, and the incorporation of customer and partner input.

2.1.1 Conducting up-front homework and gathering “Glocal” input are primary factors that should be incorporated in the NSD process of successful service programs

Results from this study reveal that, for international service programs to be successful, two features should always be included in the NSD process. These include: conducting the necessary marketing research, and gathering and incorporating input from local as well as global sources. The companies that had winner programs, prior to actually designing the service, thoroughly study the market, conduct early project assessments, and emphasize customer benefits. In addition, when these successful companies introduce new services to the international markets, they also put substantial emphasis on gathering input during the early stages of the process, and in facilitating the incorporation and coordination of internationally dispersed information. Thus, it would be wise for managers to put in place a NSD marketing research team that would be able to gather and coordinate this type of information. This would help in ensuring that their new service offering relates to market needs and trends, and ultimately it would help in ensuring the success of the offering.

Being effective in managing service development for the global arena might help companies to improve their performance from several perspectives. According to this study, companies that incorporated both of these factors (i.e., “Glocal” input and Up-Front Homework) proved to be more successful on each and every one of the performance measures. This means that such organizations can enjoy a higher success rate with their new service ventures, experience higher sales and market share, have a better control over their expenditures, achieve greater profits and are more likely to uncover windows of opportunity for new markets. Consequently, managers who

incorporate these two elements in their global NSD process should expect to see a favorable impact on their performance, overall.

2.1.2 Having a clear global strategy and planning a global launch are also important factors in yielding successful service programs

Findings show that having a clear global strategy leads to successful service programs. This implies that companies must have a clear set of strategic goals as well as a worldwide innovation charter specifying objectives and responsibilities. According to this study, a clear global strategy is of particular importance if a firm is aiming for a high success rate for its new service development projects. Managers wishing to attain a high success rate should strongly consider starting their NSD effort by first establishing a clear strategy, which will provide direction for their projects. When companies are capable of fitting their goals with strategy, this also means that there is a better fit with resources and strengths and therefore, they are more likely to succeed. Moreover, when organizations have laid out a clear global strategy, they are also more likely to yield new windows of opportunity.

Winner programs compared to less successful global NSD programs, according to this study, also have a carefully planned out launch for their new services. The launch is formal and well thought out and it is based on solid market information. These more successful firms actively promote their new services to the frontline personnel and train them to possess the knowledge and skills necessary to deliver the service. They also empower frontline personnel to “recover” failures. Companies that plan their global launch not only achieve greater sales but also have a better control over their NSD expenditures. Although commercializing a new service can require substantial costs,

when considering the benefits that can be derived from planning a global launch, management should carefully prepare the launch for its international new service developments.

2.1.3 Having a detailed formal NSD process in place and incorporating customer and partner input are secondary but important factors in aiming for successful programs

Having a detailed formal NSD process in place means that the company follows a set of clear stages when developing new services. This may include clearly defined GO/No GO decision points, specific activities, and the use of gatekeepers. This construct was found to have an important effect on achieving a high sales impact. This shows that careful planning and mapping out the entire process from idea to launch helps to ensure that new services meet customer needs, are well designed and appropriately marketed to reach high sales objectives. Furthermore, companies that had a formal NSD process in place experienced a secondary but positive effect on the remaining four performance measures. This signifies that it is in management's best interest to have a detailed process implemented, because not only are higher sales more likely to be engendered, but greater profits can be generated, higher success rates should be yielded, new windows of opportunity will be derived, and spending on budget can be better controlled

The research results also show that the extent of customer and/or partner input could assist in distinguishing between successful and less successful international service programs. Companies with successful NSD programs are more likely to have NSD processes that incorporate customer input during all the stages. These firms also have the tendency of linking with local partner units when launching their new services. Once

again, when organizations incorporate customer and partner input in their NSD process, they experience a positive impact on both sales and profits. Therefore, management ought to consider including customer and partner input throughout the NSD process, in order to achieve sales and profits of greater magnitude.

2.2 “How” should the global NSD process be carried out

Although it is important to understand what the global NSD process should consist of, it is also necessary to develop insights about how service managers should approach the NSD process. According to the results of this study, in order to develop successful new services for international markets, managers should have worldwide team involvement and should share knowledge within the organization, worldwide. Moreover, the quality of the global NSD process is enhanced when teams are cross-functional and have strong leaders.

2.2.1 Involving the team worldwide and sharing knowledge within the organization worldwide are essential components to attain successful NSD program performance

Even though involving the team worldwide and sharing knowledge within the organization worldwide would appear to be obvious components underlying any new service development effort aimed at international markets, the results in this study show that they are key distinguishing factors between successful and unsuccessful service programs. In other words, there are many firms who do not do the obvious. When NSD teams include members from different countries, new service programs are more successful. These team members are typically given opportunities for face-to-face

interaction between geographically dispersed colleagues. When necessary, teams even involve frontline personnel from different locations to take active part in the new service development endeavors. Team involvement worldwide appears to have a significant effect on the success rate and sales impact of new service developments. Therefore, if for example a manager's main interest is to achieve high sales, he should place great emphasis on the structure of his team. Involving teams worldwide in a NSD effort, also has a noteworthy positive impact on profit returns, window of opportunity and spending on budget. Consequently, a service geared toward the international market can probably be more successfully developed when individuals from different backgrounds are involved.

According to this study, managers from organizations with successful service programs encourage contributions from NSD team members in different countries. The managers who stress knowledge sharing across different geographical subunits, and who emphasize responsiveness to differences in local markets direct successful programs. Furthermore, having a NSD culture where knowledge sharing is encouraged worldwide also has an important bearing on two performance measures. If a company's main objective is to generate profits and/or spend on budget, then management should strongly consider sharing knowledge within the organization worldwide.

2.2.2 Having a cross-functional team and strong leadership are secondary factors in determining how the global NSD process should be carried out to yield success

According to the present study, having a cross-functional team with strong leadership is only of secondary importance in distinguishing successful from less successful NSD programs. Organizations that had accountable leaders that were

responsible for carrying out projects through the entire NSD process, and who guided teams that were multi-disciplinary appeared to have an impact on performance measures such as spending on budget, profit returns, and to a lesser extent on sales impact. Although this dimension may be of secondary importance, managers should nevertheless take it into consideration when pursuing such objectives. Moreover, it is quite possible that in the global situation, a more key factor to success is placing emphasis on creating a cross-country team, rather than a cross-functional team.

3 Factors that did not have any significant impact on program performance

In this study, two factors were not significantly related to new service program performance for global markets. These included *IT as Part of the New Service*, and *Internal Communication and Uses of IT*. Perhaps for service companies, particularly in the business-to-business sector, IT does not necessarily have to be a component of the new service to be successful. For example, a new service that is people-based, such as consulting, does not require IT to be successful; it requires rather, a physical presence. Also, the dimension of internal communication and uses of IT may not be relevant for distinguishing more versus less successful NSD programs because most companies, regardless of whether their programs are successful or not, do use IT to communicate within the company and worldwide. In other words, IT and effective internal communication are simply normal parts of doing business. This was supported in the interviewees where they all claimed to use means such as faxes, e-mail, intranet, and video-conferencing. Thus, one may understand why these factors did not have any impact on program performance.

4 Conclusions

This study identified the factors that describe the NPD process and that potentially impact global new product performance for firms in the business-to-business services sector. The underlying purpose was to develop insights and test hypotheses about possible differences that may exist in developing new services for the domestic market as opposed to services aimed at the international market. Considering that this study is part of a much broader benchmarking study (i.e., de Brentani and Kleinschmidt, 2000), the findings cannot be compared to previous research conducted on determinants that explain performance for the international NSD program of firms. However, the findings suggest similarities with respect to what is found in the literature on the NSD process and its impact on performance. The research propositions in this study have been confirmed by both the statistical analysis of the database and managers in the field. If an organization has a sound knowledge of **what** the NSD process should encompass and **how** it should be carried out when developing and introducing new services to global markets, chances are it will experience a favorable impact on financial and non-financial performance measures such as success rate, sales impact, spending on budget, profit returns, and window of opportunity. Consequently, much of what has been said about the NSD process of domestic business-to-business services can also be generalized to industrial global service programs.

5 Limitations and Future Recommendations

This study of the global NSD process was part of a much broader analysis that investigated new service development programs of firms. By studying a company's NSD program—as opposed to individual projects—to determine success factors is more realistic, because it encompasses the overall picture of the company and its NSD efforts. At the same time, when looking at many different projects and activities over several years, we are obviously also dealing with average behavior and average outcomes, and this creates some difficulties from an analytical standpoint. Previous studies conducted on individual projects have indicated that service firms often experience difficulties in evaluating the performance of their new services. Consequently, when asked to assess projects over a period of three years, this may prove to be even more challenging for respondents, even though it is understood that corporate performance is based on an entire program of NPD effort.

Although the NSD process was only one of many dimensions that were investigated (in de Brentani and Kleinschmidt's (2000) study) and expected to have an impact on the performance factors, the study in this thesis focused solely on the NSD process, which is a factor that has been shown to impact the success of programs. Clearly, there are many other factors that can have an impact on performance (e.g. market elements, size of firm, characteristics of the new service itself, etc.). The advantage of focusing solely on the NSD process is that a great detail of insights can be derived. On the other hand, as is the case for this thesis, the use of only one dimension can yield low R^2 values. Nevertheless, the R^2 values were in most cases, highly significant and did provide valuable insights (i.e., what factors are linked to different types of performance).

Questionnaires were answered and interviews were conducted with managers and directors from several different industries. Although this provided a broad array of insights and some generalizability, the fact that the sample for both the quantitative survey and the field studies was composed of different industries, may be of concern. Given that industries differ one from another, perhaps studying industries individually might bring about some adjustments in the dimensions of the NSD process that influence the performance of global service programs. Therefore, another recommendation for future research would be to split the sample by industry in order to assess the impact constructs of the NSD process have on performance measures. This was not carried out in the current research because the sample was too small and too diverse to be divided. A larger sample would thus be required to carry out such a study.

A sample of greater magnitude would also have been desirable for this current study. Even though the analysis conformed to Nunally's (1978) recommendations for exploratory research, when the sample was split between winner and less successful programs, some of the sub-samples were rather small. For example, for the performance measure of profit returns, sample sizes ranged from 22 for less successful programs to 47 for winner programs. Furthermore, when asked to answer questions on profitability, many companies claimed that this was not applicable to their organization and as a result their case was treated as a missing value during analysis. This may be explained by the fact that global NSD effort is a very recent phenomenon for many service firms. Consequently, their efforts can probably be better measured through performance measures such as sales, success rate and window of opportunity.

Having more than one individual per company to respond to the questionnaire would have also been preferred, because more than one perspective would have been obtained. Nevertheless, the individuals that did answer the questionnaire had a sound knowledgeable of their company's NSD program and process. In larger firms, respondents held positions such as V.P. of Marketing, and V.P. of Global Development, and in smaller companies, participants held positions such as C.E.O, President, and V.P. of Business Development. Consequently, given the positions held by the respondents, it is not unreasonable to assume that they were very familiar with the process used by their firm. Although in certain cases more than one respondent answered the questionnaire, a future recommendation might be to obtain for each company more than one perspective.

In addition, the respondents of the questionnaire and the individuals that were interviewed were all from Canada. A recommendation for future research would be to conduct the same study with managers of service firms from other countries. For example, it would be interesting to investigate whether Chinese managers, whose culture differs substantially from ours, would have the same perspective as Canadian managers. Finally, considering how this is part of a broader benchmarking research that has never been previously investigated, this study should be replicated to see if similar results would be obtained.

VIII REFERENCES

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IX APPENDIX

APPENDIX A

Following you will find the set of questions that were asked during the interviews. The participants were not provided with this questionnaire during the interview.

Questions for Interviews

A. GENERAL QUESTIONS

- 1) What type of services does your company offer to international markets?
- 2) To what extent does delivery of the service involve interaction with clients?

B. NEW SERVICE STRATEGY

- 3) From the type of strategies just mentioned which one best describes your firm and why?
- 4) In your NSD program for international markets, does your company have a clear set of strategic objectives?
- 5) Are the objectives, responsibilities and expected contributions of the international service made known to all NSD teams and key players?
- 6) In setting a strategy for your international NSD program, how important is it to your company to be the first to enter new strategic markets?
- 7) Does your company develop new services using a centralized approach to formulate a worldwide strategy or does it develop independent local strategies?
- 8) In planning your global NSD program does it consist of active involvement from all groups taking part in NSD worldwide?
- 9) Does management encourage contributions from NSD team members located in different countries?
- 10) In creating a global NSD program, does the firm emphasize responsiveness to differences in local markets?

C. PROJECT TEAM

- 11) Is there an accountable leader responsible for driving the project?
- 12) Do leaders see projects through the entire NSD process from idea to launch or just for one or a few stages?
- 13) For global NSD who is involved, what types of teams are used? i.e., are teams cross-functional multi-disciplinary coming from different functions or are teams composed of individual functions?
- 14) Do these teams include members from different countries and regions? If yes, to what degree?
- 15) Do these teams actively involve frontline personnel from different locations worldwide?

D. NEW SERVICE DEVELOPMENT PROCESS

- 16) Does your firm use a formal NSD process- i.e., a standardized set of stages and GO/No GO decisions that guide all international new product activities from idea to launch?
- 17) Does your international NSD process consist of clearly defined specific activities for each stage of the process?
- 18) Does your international NSD process have clearly defined GO/No GO decision points for each stage of the process?
- 19) Is your global NSD process used for most projects regardless of their level of innovation?
- 20) Does your global NSD process incorporate customer input during all stages?

Idea Generation

- 21) Does management encourage employees worldwide to submit new service ideas? i.e., an innovative corporate culture?
- 22) What sources (i.e., customers, employees, competitors) do you use to generate ideas for new services?

Evaluation-Business Analysis

- 23) What kind of marketing research does the firm carry out in introducing new services to the international market?
- 24) When developing new services for international markets how does the firm go about in gathering information? i.e., is knowledge created in the firm's main market and then transferred to local markets or is it developed in local units and then diffused throughout the international organization?
- 25) How thorough are studies of markets conducted?
- 26) How is internationally dispersed information shared between the organization worldwide?
- 27) In gathering input from worldwide locations do you find they are highly coordinated during early stages of the NSD process or during the later stages?
- 28) Does the company conduct early project assessment and analysis *before* developing the new service?
- 29) Before developing the new service does the firm develop complete project definitions- i.e., identifying a target market, service concept, benefits & features?

Development and Testing

- 30) Before developing a new service does the firm test market acceptance of the new service idea, domestically and internationally? If yes, how is it carried out?
- 31) How does your company go about in designing/developing a new service?
- 32) How much emphasis does the organization place on developing unique or greatly improved customer benefits?
- 33) When developing a new service does your company use a different NSD process for domestic and international markets?
- 34) Does the firm conduct any form of testing on the new service? What kind and how?

Commercialization

- 35) When launching new services to international markets, how formal is the launch?
- 36) When launching a new service to the international market does your company undertake a simultaneous launch in all or most international markets or does it implement a market rollout?
- 37) To what extent is the launch built on market information gathered from international marketing studies?
- 38) Prior to launch is awareness created about the new service to frontline personnel in all locations?
- 39) Does your firm have any formal guidelines to be followed by frontline personnel?
- 40) Does part of the training consist of empowering frontline personnel to recover potential service failures?
- 41) In order to launch a new service, does the firm link up with knowledgeable local partner units?
- 42) After launch, does the firm assess its performance to see whether the new service is meeting objectives?

COMMUNICATION AND TECHNOLOGY

- 43) What communication tools does the firm use to interact among geographically dispersed sources of NSD knowledge?
- 44) In your firm to what extent do you think that advances in communication and IT have helped your organization in reducing barriers to accessing foreign market?

PERFORMANCE

- 45) Over the last three years, from the global new service projects that entered development and had significant amounts of money spent on them how many were launched and proved to be commercial successes? Why?

- 46) In terms of sales performance, how successful was your international NSD program in meeting its sales revenue? Can you think of anything that could have been done differently that would have had a positive impact on performance?
- 47) In terms of spending over the last three years to what extent were the services of your global NSD program developed on budget?
- 48) In terms of profitability, how successful was your international NSD program in meeting its profit objectives? Can you think of anything that could have been done differently that would have had a positive impact on profitability?
- 49) On average, how successful was your global NSD program in opening new markets for your firm? Can you give me an example?

APPENDIX B

Description of Companies that participated in interviews

Company A

Company A is a Canadian company engaged primarily in the railroad transportation business. Its headquarters is located in Montreal, Quebec and it transports goods such as petroleum, chemicals, grain, fertilizers, coal, metals, minerals, forest products, and automotive parts. It is a fairly large corporation, employing almost 25 000 people in Canada and the U.S. alone. This is a very reputable service organization known for its just-on-time delivery of goods and for its consulting services. Company A was incorporated in 1919, and in that same year it expanded its business to the United States. The presence in the U.S.A. was further amplified by various acquisitions that ultimately led to equity ownership of three foreign markets, namely England, Australia, and New Zealand. Company A's revenue for fiscal year 2000 was five and a half billion dollars with 76% being derived from international transportation services. This company believes that great opportunity resides in the NAFTA corridor, and hence it expects to grow significantly in the near future because of additional acquisitions that will transpire in the US and Mexico. While company A has operations internationally, its main focus continues to be North America.

Company B

With headquarters located in the United States, company B is one of the big five accounting firms that offers professional accounting and audit, assurance and advisory, tax and management consulting services to thousands of enterprises in the public and private sectors worldwide. It employs over 95 000 people around the world to serve needs of many different clients. Client service excellence is an integral part of the method by which this company conducts its business. Company B offers a full array of consulting services including: customer relationship management, e-technology integration, emerging business solutions, corporate strategy, offshore development, global strategies and operations, financial and performance management, and so on. Their wide range of services are offered in over 35 countries. For example, they offer consulting services in the United States, Canada, Japan, Australia, Korea, Belgium, China, France, Germany, Indonesia, New Zealand, Sweden, Malaysia, etc. Company B is recognized as the leading global professional services organization. Given its strong global presence, this organization has also collaborated with over 400 financial advisory partners worldwide, to better serve needs of customers.

Company C

Company C is a Montreal based environmental engineering firm specializing in wastewater treatment for small flows. It originated from an acquisition that occurred in 1997 between a domestic engineering firm and an equipment distributor in the same field. This company is recognized as a leader in the field of on-site wastewater treatment and in developing new technologies. Their services consist of introducing new technologies to treat wastewater. Company C is known as a company capable of dealing with difficult situations and for coming up with innovative solutions to problems. It employs only seven individuals but has expanded internationally operating in areas such as Canada, the Caribbean, and Africa. In the near future, this company also hopes to expand its business to Asia. Given that company C is a small organization, it places great emphasis on being different to ensure its survival, because it does not have the financial resources to compete with big organizations. Consequently, continuously introducing new service innovations is key to its success.

Company D

Company D was founded in 1996, and has its headquarters in Montreal, Canada. This organization specializes in speech recognition solutions, by introducing new software technologies. Company D offers professional services to clients and partners in support of their speech recognition applications and solutions. Their technologies have been implemented as efficient internal and external communications solutions in a wide range of market sectors including: education, healthcare, financial, and corporate sectors worldwide. They work closely with their customers in order to configure the services according to their needs. As a result, this firm has the largest customer base in its field, owning 24% of market share. Company D only has workers in Canada and employs approximately 50 employees. However, it offers its services in Mexico, France, Germany, England, the United States, and Canada. To conduct business in international markets, company D associates with local partners and meets with them on a regular basis to verify that contracts are carried out properly.

Company E

A Canadian based organization (with Montreal headquarters), company E is one of the leading engineering and construction firms worldwide. This company is also a major player in the ownership and management of infrastructure. Company E provides a variety of services including engineering, procurement, construction, project management, and project financing services to a multitude of industry sectors: chemicals and petroleum, mining, metallurgy, pharmaceuticals, agricultural, power, environment, defense, telecommunications and so on. This engineering firm has expanded its business globally since 1963. Company E employs 6300 individuals and has office locations in 30 countries other than Canada, such as the United States, Peru, Brazil, Venezuela, Belgium, England, France, Algeria, Tunisia, Kazakhstan, China, Thailand, Egypt, and Australia, and operates in some 100 countries. One of its future goals is to generate 50% or more of its revenue from contracts outside Canada.

Company F

Company F is part of a larger group of companies that belong to a major corporation, that is a global leader in the Automation and Controls industry. Company F is a specialized consulting firm that provides international pharmaceutical and biotech companies with regulatory compliant automation and engineering solutions. Services provided include pharmaceutical engineering solutions, quality inspection solutions, and validation solutions. Furthermore, they offer services such as process design, design review, integration and project management. Its headquarters are located in London, England, and it offers services throughout North America and Europe. It employs over 100 pharmaceutical industry specialists to conduct its business worldwide

Company G

Company G was founded in 1832 in Canada. This company, aside from being one of North America's leading financial institutions, is also Canada's most international bank. This organization offers a multitude of retail, commercial, corporate, investment and international banking services to customers around the world. Business-to-business customers have access to these services through branches, agencies, representative offices, subsidiaries and affiliates, located across the globe. Company G serves customers in all continents, employs 51 000 people, and has over 2000 branches and office locations in some 50 countries. This organization is the most international of the Canadian Banks and has served the international arena for over a century. Company G is recognized as being the leading provider of financial services in the Caribbean, and of having the most extensive Asian network of any Canadian bank. Moreover, Company G is active in the Latin American market through subsidiaries in Argentina, Chile, Costa Rica, El Salvador and Mexico, and affiliates in Peru and Venezuela.

Company H

Company H is a Canadian based company founded in 1871 whose headquarters are located in Toronto. This organization, employing over 30 000, is one of the world's leading financial services firm, which provides a full range of financial services to both individual consumers and corporations. Life, health, and disability insurance, mutual funds, annuities and savings, investment management, trust services and banking services are among the many services this company provides. Company H started its international expansion in 1893, in England. Although it has a solid global presence throughout the world, the major operating activities are taken care of in offices located in Canada, United States, Philippines, Hong Kong, India, and China.

Company I

Company I was founded a little over 30 years ago in Canada. This firm is an independent global partnership that offers predictive business intelligence, strategic advisory, transactional and investment related services to both financial organizations and corporate participants in the capital markets of the world. It is known to provide the highest quality intelligence and management counsel for leading decision makers in the financial district. Company I employs approximately 300 people and offers its services in 40 countries to the world's leading financial institutions located in the United States, Canada, Europe, Asia, and Latin America. Only 9% of its revenue is derived from Canada. The majority of its revenue is generated from the United States (37%) and from Europe (32%).

Company J

Company J founded in 1710 in England, is the oldest insurance company in the world. It provides a wide range of insurance and financial services to customers worldwide. Company J expanded its business internationally in 1851 by providing its services in Canada. This organization employs over 50 000 people and operates in more than 130 countries. It is classified, worldwide, as one of the top three of multinational property and casualty operations. It is known as a leader in solving complex business insurance needs. It has especially strong market positions in the UK, USA, Canada, Scandinavia, and Australia. Approximately 40% of its clientele consists of business-to-business customers. Company J offers multi-line coverage for businesses of all sizes. For example, it provides alternative risk and loss control programs for national and multinational corporations.